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THE FAMILY HANDYMAN DIY University

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FALKEN TIRE
ON THE PULSE

STUFF we love

BY MARK PETERSEN editors@thefamilyhandyman.com

A SAWHORSE AND THEN SOME

The Centipede is a multi-legged, portable support base that folds out in seconds and is as versatile as it is funky looking. It can function as a workbench, tool stand, table base, or as a pair of good old-fashioned sawhorses. It's not only perfect for construction but also handy on a camping trip, tailgating or anywhere you need a stable platform. The two sizes both come with quick clamps to cinch down sheet goods, and X-cups designed to hold 2x4s. The 2 x 4-ft. model can support 1,500 lbs. and costs $80. The 4 x 8-ft. version costs $160 and can handle 3,000 lbs.! They're available at Lowe's.

THE FAMILY Handyman

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VACUUM-POWERED ROTARY TOOL

The folks at Dremel figured, if you're going to connect a vacuum to your power tool, why not kill two birds and have the vacuum *power* the tool as well. That's right—this rotary tool has no motor and is powered solely by the suction of a vac! It's certainly a new twist on the concept of an "air-powered" tool! We tried it out on a couple of light sanding tasks, and it worked well. The lightness of the tool felt a little strange at first, but the airborne dust was negligible to nonexistent. Pick up a VRT1-1/5 rotary tool at Lowe's or online at Amazon for $30.

COMPACT, ADJUSTABLE SAW STAND

Sure, this miter saw stand has no outfeed supports or wheels, but that makes it super compact—about half the size of other stands. And its heavy-duty construction creates a rock-solid base. It also has a couple features you won't find on other saw stands, like a built-in GFCI-protected power strip and adjustable legs, which are extremely handy for cutting outside on uneven ground. The WS-31 work station is available at some home centers and hardware stores. Find a dealer near you at protocolequipment.com. This stand is a heck of a value at $77.

SHIM IN A BAG

We've had a few of these Winbags kicking around the office for a while now, and even though they're designed as temporary shims for window installers, we've used them for all sorts of other jobs. I brought one home to raise my heavy truck tires a bit, which made it easier to align the lug nuts with the rims while rotating tires. Our set builder used one to shim under a door during installation. Another editor grabbed one to assist in leveling a washing machine. Only one guy in the office thought they were silly. Needless to say, he didn't get one (and I think he secretly regrets it). A Winbag can lift 220 lbs.! They cost $20 apiece online.

Mark Petersen, Associate Editor

THE ULTIMATE CUTTING MACHINE

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BladeRunner X2

The new BladeRunner X2 from Rockwell is the go-to cutting machine for hobbyists and pros alike. At less than 15 pounds, it sets up in seconds and travels anywhere. Versatile T-shank jigsaw blades cut everything, even ceramic tile. Perfect for quick rip, scroll, crosscuts, and intricate miter cuts.

ROCKWELLTOOLS.COM

FAST, FLEXIBLE FIX

Here's a cool product that can get you out of a jam. FiberFix is a flexible repair wrap. All you do is dip it into room-temperature water and wrap it tightly around whatever's busted. Fifteen minutes later, the wrap turns rock solid and you're back in business. Use it to repair a broken shovel or wheelbarrow handle, tent pole, canoe paddle or whatever needs fixing. Stow a roll in your camping gear, your RV and your roadside emergency kit. Buy a 1-in. x 40-in. roll for $6 at home centers or at fiberfix.com.

SPRING CLAMP UPGRADE

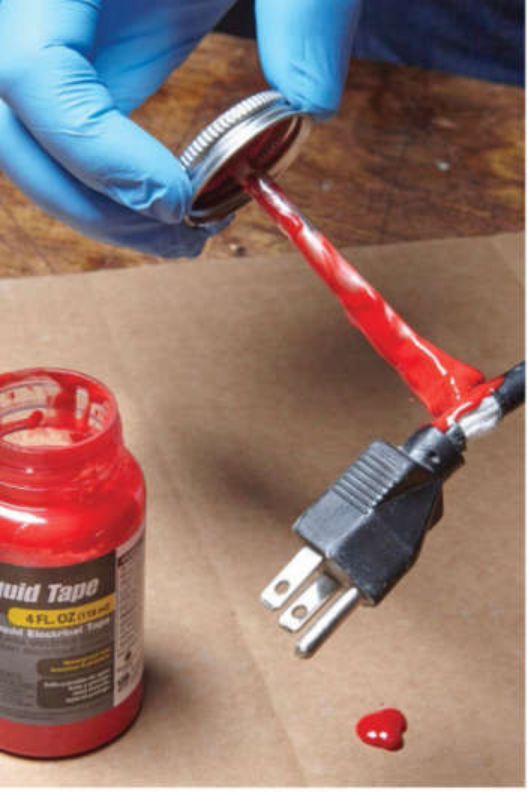
Sometimes new tool features can seem a little gimmicky. That was our first impression of the Bandy Clamp, which is basically a spring clamp with a rubber band connecting the two jaws. However, we quickly changed our minds when we put it to work in our shop. It's perfect for clamping solid edging onto plywood and excels at holding stuff like electrical cords and air hoses in place. Plus, it can do everything a standard spring clamp can do, so you don't need both kinds. They cost $20 a pair, but you'll want more than a couple Bandy Clamps for edge-clamping, so consider buying three pairs for $50. You'll find them at any Rockler store and at rockler.com.

DIY WORK WEAR

MUSHER APPROVED

I spend a lot of time working and playing outdoors in the winter, so good gloves are a must. These Kinco insulated work gloves have become my all-time favorites. I learned about them from sled-dog mushers, who swear by them. The pigskin palms are very tough and don't get stiff after they've been wet. The insulated lining works surprisingly well, and the cloth back lets your hands breathe. They're available with safety cuffs (easier to slide on) or elastic cuffs (keeps snow out better). Best of all, they're only about $18 a pair. I've owned ski gloves six times more expensive that weren't as warm or nearly as durable. Buy a pair of Kinco gloves online.

Ken Collier,
Editor in Chief



CONNECTION PROTECTION

Electrical tape will always be useful for certain applications, but for a strong, flexible, watertight connection that won't ever unravel, you can't beat liquid tape. We used it a few months ago to fix a bunch of frayed electrical cords in our shop, and so far it's held up great. It's also perfect for protecting wires on motorcycles, snowmobiles, ATVs, cars, trucks and trailers, or any connection that's subjected to vibration or exposed to the outdoors.

You'll need to apply a few coats of liquid tape to get a good, thick layer (five minutes between coats), and it's a little messy to work with, so plan on a few drips. The product shown here is made by Gardner Bender and is available in black, red, green and white. You'll find it for $7 in the electrical department at home centers.

Josh Risberg, Set Builder

THE ONLY TOOL SET YOU NEED

You probably don't have a complete set of sockets and wrenches in your tool bag or the emergency vehicle kit under your truck seat. And you don't have to if it contains the new Crescent Pass-Thru Adjustable Wrench Set. This compact tool kit features 10 spline-style sockets that work with hex, square and external Torx fasteners, from 10mm to 19mm and 3/8 to 23/32 in.

The pass-through sockets fit over protruding bolt threads and nuts mounted on studs, eliminating the need to carry deep sockets. For more grabbing power, simply replace the smooth jaw with the serrated side, and you've got yourself a pipe wrench, perfect for stripped bolt heads and pipes up to 1 in. The kit costs $30 at homedepot.com.

Rick Muscoplat, Contributing Editor

NO MORE KNOTS

I like using ropes to secure my tarps, but I hate tying knots. I can never seem to keep the tension before the knot is finished, and no, I was *not* a Boy Scout as a kid. The CamJams from Nite Ize have come to the rescue. Now all I have to do is anchor one end of the cord, run the other end through the CamJam; clip the CamJam to a grommet, and pull the cord—nothing could be easier. I also use them when I want a quick, temporary clothesline in my backyard. They come in a couple sizes. I bought a two-pack for $7 at a home center.

Paul Nelson, Freelance Photographer

LOCKED AND LOADED

Squeeze the handle, staple comes out. That's how most staple guns work, but not this one. The Triggerfire can be operated like a normal staple gun or it can be switched to trigger mode. Trigger mode allows you to squeeze the handle (like cocking a gun), and then pull a trigger to release the staple—bang! Trigger mode provides more control because you don't have to fumble around squeezing the handle while trying to keep the gun and material steady. The Surebonder Triggerfire 5690 is available for less than $20 at some hardware stores, home centers and online.

Surge protection is cheap insurance

There's a bunch of surge protectors to choose from at home centers these days, and they're more affordable than ever. The six-outlet model shown here, made by Defiant, costs only $9 at The Home Depot—that's only $1.50 per electrical appliance! At that price, there's no reason not to install them throughout the whole house. And don't forget about your larger appliances. Today's washers, dryers and refrigerators have electronic circuit boards that can be destroyed by surges.

CLEAN FIREPLACE ASHES THE MESS-FREE WAY

Regular shop vacuums and ashes don't mix. First, even apparently dead ashes can contain a spark, which can be fanned by the rushing air of a shop vacuum, igniting whatever flammables might be in the vacuum. Wood ash is also super fine and abrasive, so it tends to blow by the filter and into the vacuum's motor and your house.

The solution is an ash vac. Craftsman makes a nice one for $80. The wand, hose and barrel are spark-proof, and the filter is extremely efficient and designed especially for ashes. It's just the ticket for cleaning your fireplace, woodstove, pellet stove (for which there's a special attachment) or even your grill. You can get one at Sears stores or online. I've been using one on the woodstove at the cabin, and it really helps control the dust. Best of all, the cleanup is now a dust- and mess-free chore!

Ken Collier, Editor in Chief

INSULATE YOUR BASEMENT WALLS IN A DAY

Want to lower the chill factor in your basement but don't want to frame it up or finish it with drywall? Here's your best bet—CI Max sheathing board from Johns Manville. It glues or nails to the wall and is fire-rated, so it doesn't require a drywall fire-stop. (All other types of insulating boards require at least 1/2-in. drywall covering.)

Start by patching any cracks in your wall with hydraulic cement. Then seal the wall with a concrete sealer. Buy enough 4-ft. x 8-ft. x 1-1/2-in.-thick boards (or thicker) to cover your walls (the 1-1/2-in. thickness gets you R-9.3). Attach the CI Max boards with construction adhesive or masonry fasteners with 1-in. plastic washers. Cut the boards by scoring and snapping, and seal the seams with foil tape.

At about $40 each, the boards are pricey. But since they're fire-rated, you don't have to fur out the wall to hang and tape drywall. The boards come in silver or white foil (buy white seam seal tape to match). Some home centers stock or can order it. If you can't find a retailer, search online for "insulation suppliers." They usually have it in stock.

Rick Muscoplat, Contributing Editor

Cordless goes wireless

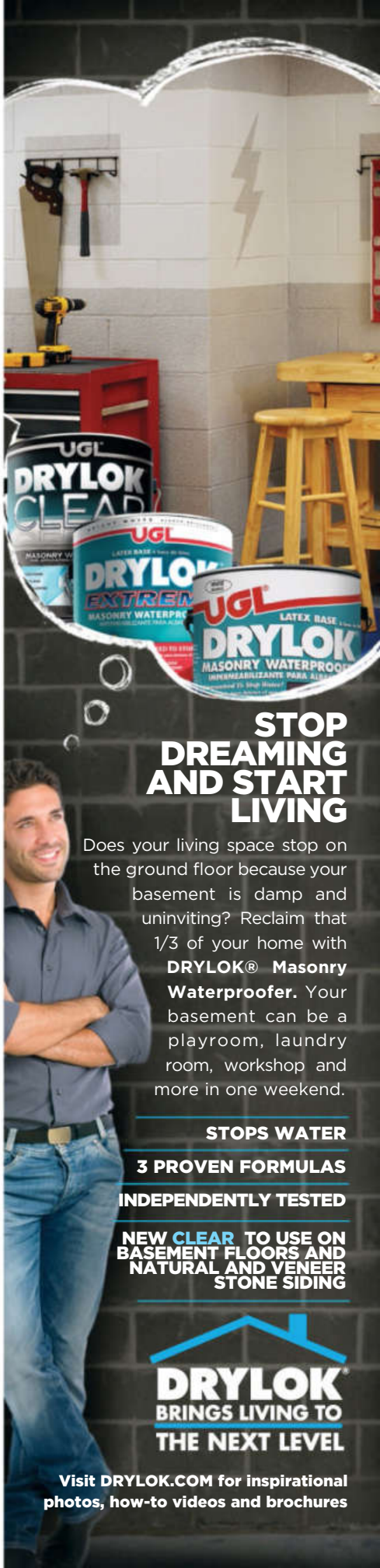
Bosch's new Power Ready Wireless Charging System is a wireless charger (also known as an inductive charger). It sends out an alternating magnetic field that charges a compatible battery. The battery only needs to be in close proximity to (sitting on) the charger, not making direct contact with it.

These batteries fit all Bosch tools that run on 18-volt lithium ion batteries. The basic wireless charging kit comes with a charger and one slim-pack battery and costs $159. Buy the kit online or at home centers that carry other Bosch products. We're hoping the next generation will charge tool batteries from across the room!

IT'S NOT A GLUE

Bondic is a liquid plastic welder that stays liquid until activated by UV rays. Just apply the liquid plastic where you need it, and then shine the LED light (included in the starter kit) on the work area for four seconds. Apply as many layers as it takes to make a sturdy connection. It creates a super-strong bond and is easy to work with because you control the cure time.

Bondic is ideal for repairing jewelry, RC models, hoses, wires, electronics, etc., but because it needs light to cure, it only works for surface welding. Think of it like a splint or cast rather than a glue joint. Buy a $22 starter kit and check out some cool videos at notaglue.com.



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FROM OUR READERS handyhints@thefamilyhandyman.com

CARGO HOOK

Packing and unpacking my truck with the tonneau cover in place got a whole lot easier when I put a utility hook on the end of a broom handle. Now I just push things in with the handle and retrieve them with the hook.

Mel Gibbons

Better bit holder

Toothbrush holders make great, inexpensive holders for drill and driver bits. You can find them at discount stores and drugstores in the sample/travel section. Label the holders with a permanent marker and keep them in your drill tote or tool pouch.

Vincent Lucrezi

Disposer lift

To replace a garbage disposer, I used the scissor jack from the trunk of my car. That not only saved me some heavy lifting but also allowed me to precisely adjust the height of the disposer. Scissor jacks can help out with other heavy lifting too. I used one to position a heavy shower door.

Mike McCleish

Perfect pipe insulation

To make fast and accurate cuts in pipe insulation, use a hand miter box and a bread knife. You can get precise 45- and 90-degree cuts for a tight fit and a professional look.

Henry Haskell

Continued on p. 19

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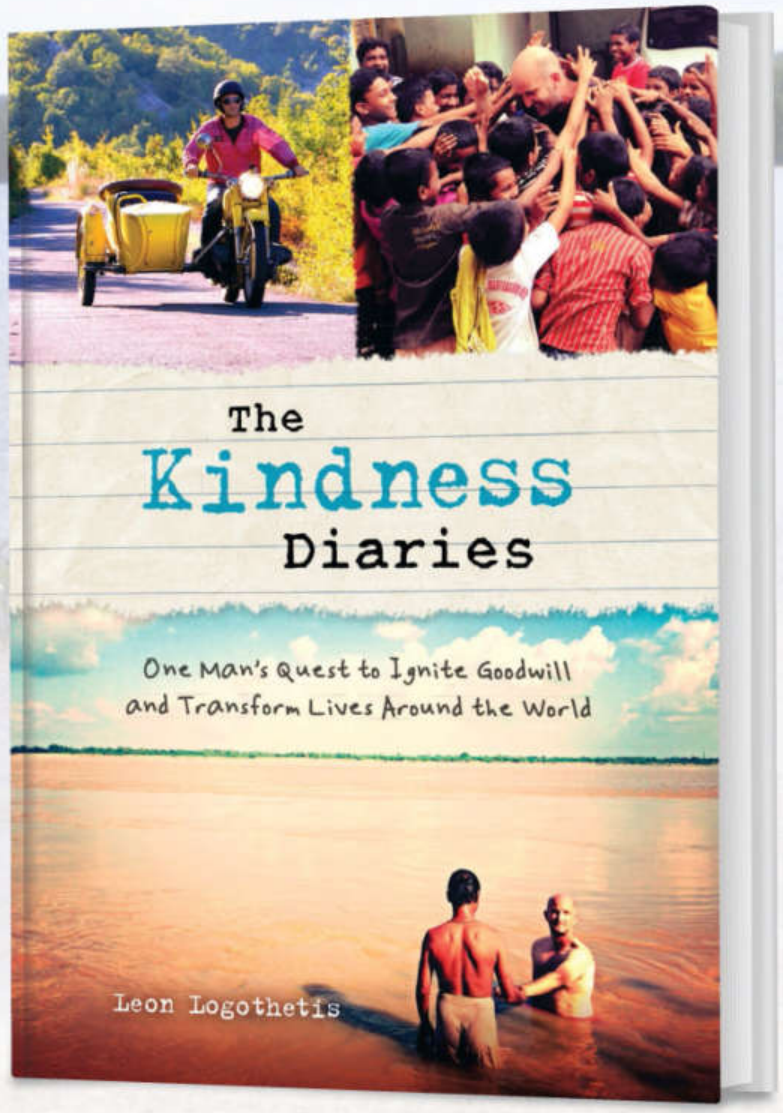
Be Inspired.
Go Inspire.



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INSTANT MIXING CUPS

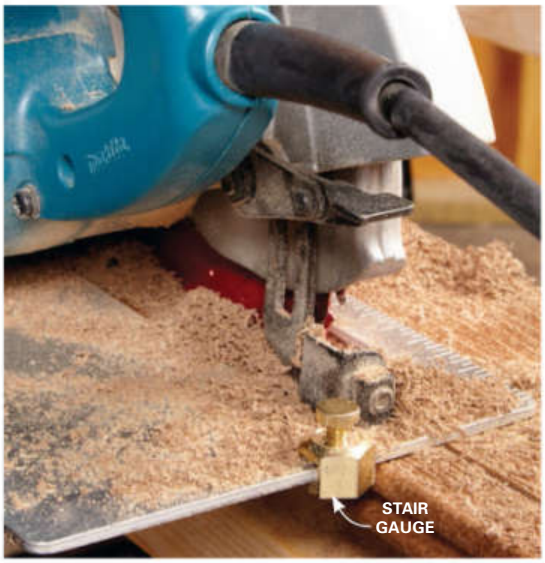
I mix a lot of epoxy in small batches, but I've seldom had the right size container on hand. I solved this problem by drilling 1-1/2-in. holes in 2x4 scraps with a Forstner bit. The resulting shallow "cups" allow easy mixing without the risk of spilling. When the holes are used up, I just make a new mixing board.

Bill Wells

Garbage lid hinge

Are you tired of losing your garbage can lid? "Hinge" it to the barrel with cable ties. Drill 1/4-in. holes for the ties and double them for extra strength. The lid will flip open and stay attached to the barrel. You'll never have to search for your lid again!

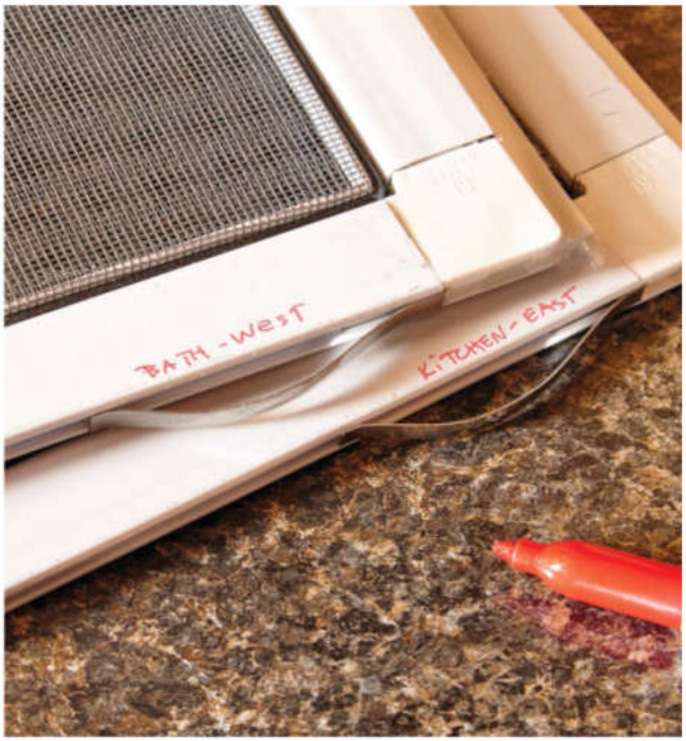
Don Tyler



Ripping-good idea

Recently I needed to rip a few deck boards to fit against the house. It dawned on me that a stair gauge could lock onto the saw's shoe and act as a rip guide. It was a perfect substitute and gave me precise cuts.

Matt Taylor



Window labels

Each year I wash all my screens and storm windows assembly line–style. It can be a hassle getting each one back in the right window. To avoid mix-ups, I labeled each screen and storm with a permanent marker in an inconspicuous spot on an outside edge. Problem solved.

Linda Gum

Get a $100 gift card for your Handy Hint!

See p. 4.

WICKED SHARP!

Sharpening a chisel is cheap, easy and fast with the sandpaper method

As a professional tool nut, I've tried every system under the sun to sharpen chisels. The very best methods require hundreds of dollars in equipment and materials, but you can get great results for about $40 using just sandpaper and glass.

A chisel that's in good shape and only in need of a new edge can be sharpened in less than five minutes. But if your chisel is really dinged up, this method would be way too slow, so we'll also show you how to speed up the process by prepping your chisel with a bench grinder.

by Tom Caspar
editors@thefamilyhandyman.com

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **TOM FENENGA**

PART 1: BASIC SHARPENING

Getting started

The first thing you'll need is a piece of 1/4-in.-thick glass. The exact size isn't important. A glass shelf, which you can buy at a home center for about $10, works well. Glass is extremely flat, so it's ideal for sharpening.

Next comes the sandpaper. Use high-quality sandpaper—pick the most expensive paper at the home center. The cheap stuff cuts too slow and wears out fast. Look for a combo pack that includes 80-, 150- and 220-grit paper.

You'll also need spray adhesive for sticking the sandpaper to the glass. A low-tack adhesive is best (it's available at art supply and craft stores), but the standard spray you'll find at home centers is also OK—just follow the directions to make a "temporary bond." When you change paper, use a solvent to remove glue residue from the glass (lacquer thinner works great). Low-tack sprays leave much less adhesive behind than standard sprays.

Cut a sheet of 80-grit sandpaper to fit your glass, then spray a small amount of adhesive onto the sandpaper and press the sandpaper onto the glass (**Photo 1**). Repeat with 150- and 220-grit sheets. Apply the sandpaper to

Caution:
If you're used to semi-sharp chisels, be extra careful with your freshly sharpened chisel. It will slice through wood faster and easier than you expect. Keep your fingers out of its path!

1 GLUE SANDPAPER TO GLASS
Prepare your sharpening surface by spraying adhesive on the back of a sheet of 80-grit sandpaper. Stick the sandpaper onto a piece of 1/4-in. glass. Add 150 and 220 grit, too.

2 FLATTEN THE BACK
Rub the back of the chisel on the 80-grit paper until the first 2 in. are covered with scratches (see inset). Repeat with finer grits, rubbing in different directions so you can track your progress. You only have to do this once on a chisel.

3 SET THE HONING ANGLE
The fastest way to get a really sharp edge is to use a honing guide. Clamp the chisel so it projects 1-3/16 in. from this type of guide; this will produce a 30-degree angle.

4 SHARPEN ON SANDPAPER
Roll the honing guide on the 80-grit sandpaper to sharpen the chisel. You don't need oil or water for lubrication.

both sides of the glass—this will prevent the glass from sliding around.

Flatten the back

It's easy to forget that every edge tool has two sides that need maintenance. They're equally important, but let's talk about the back of your chisel first. The back should be dead flat, which enables the tool to cut straight, and as smooth as the beveled side.

The process of making a flat, smooth back is called "lapping." Fortunately, you only have to lap a chisel once. Almost every chisel needs to be lapped, even one right

5 FEEL FOR A "WIRE EDGE"
Keep honing until you can feel a slight ridge of metal start to form all the way across the chisel's back. This "wire edge" indicates that the chisel's end is sharp.

6 REMOVE THE WIRE EDGE
Rub the back of the chisel on the 220-grit paper to remove the wire edge. To produce an even sharper edge, repeat the honing process on 150- and 220-grit paper.

out of the package, but some require much more work than others. In any case, you don't have to lap the entire back—just the first 2 in. or so.

The first steps in lapping are to find out how much metal you must remove and which grit to start on. Pressing hard, rub the back of the chisel a few times on

7 POLISH THE EDGE
Set the chisel back 1/16 in. in the guide, then drag the edge backward on a piece of wood charged with buffing compound. The result: wicked sharp!

WHICH HONING GUIDE IS RIGHT FOR YOU?

Some experts master the art of sharpening entirely by hand. But for the rest of us, a honing guide is essential. There are basically two types of guides: Some clamp a chisel from the sides, while others clamp top to bottom.

The side-clamping guide works only with chisels whose sides taper to an edge that's less than 1/16 in. thick. If your chisels have thicker sides, you'll need a guide that clamps top to bottom.

The side-clamping guide shown here is made by many manufacturers and is widely available in woodworking stores and online (about $15). Inexpensive top-to-bottom clamping guides, made by General Tools and Stanley, are harder to find in stores but are also available online. The General 809 runs about $20; the Stanley 16-050 costs about $15 and includes a combination oilstone and honing oil.

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220 grit (**Photo 2**). Go in a diagonal direction. Turn over the chisel and look at the back. If it's nearly covered with scratches, continue lapping on 220 grit. If there are scratches only on a few high spots, you'll need to start with a coarser paper. First try 150 grit; if that goes too slowly, use 80 grit. No matter which grit you start on, keep at it until the scratches extend across the full width of the back.

Let's assume that you started with 80 grit. The next step is to make finer scratches with 150 grit. This time, push the chisel in the *opposite* diagonal direction. Keep going until you can't see any of the 80-grit scratches. Repeat the process on 220 grit. Push the chisel in a new direction—in and out—until the 150-grit scratches disappear.

Hone the edge

The most efficient way to sharpen an edge is to use a honing guide. (See "Which Honing Guide Is Right for You?," p. 23.) The guide holds the tool at a fixed angle, so that every stroke counts. With most guides, that angle is determined by the distance the blade projects from the guide. You could use a ruler to measure this distance (30 mm, or 1-3/16 in. on the guide shown here), but it's awkward. Here's an easier way: Draw a line 1-3/16 in. from the edge of a piece of wood, then extend the chisel to the line (**Photo 3**).

Start by sharpening on 80 grit (**Photo 4**). Keep going until you can feel a ridge of metal (a "wire edge") start to form across the back of the blade (**Photo 5**). This indicates that the bevel has come to a point.

Remove the wire edge by rubbing the back of the chisel on 220 grit (**Photo 6**). A few strokes should do it. Next, hone the bevel on 150 grit until you develop a new wire edge. Remove the wire edge on 220 grit again.

The last step is a bit different: Hone the bevel six strokes on 220 grit, then flip the chisel over and rub the back six strokes. Repeat this four or five times and you'll have a sharp chisel—probably the sharpest chisel you've ever used.

Want it even sharper?

If you need a super-sharp edge, continue honing with finer sandpaper or buffing compound (**Photo 7**). Buffing compounds come in different grits. They all work, but I recommend Ryobi "D" (available at home centers for about $8). First, pull back the chisel about 1/16 in. in your honing guide so you'll be sharpening only right at the chisel's tip. Rub the compound on a piece of plywood, then pull the chisel and honing guide across the compound a dozen times or so. (Don't push, or the edge will dig in.) The buffing compound creates a mirror polish, resulting in an edge that's wicked sharp!

PART 2: PREP A CHISEL FOR SHARPENING

If your chisel is in really bad shape, like the one shown in **Photo 1**, sharpening on sandpaper would take forever. To remove a lot of metal quickly, you need a power tool—preferably, a bench grinder.

Before we get going on the grinder, remember this: Heat kills. Grinding will naturally heat up your chisel, but too much heat will kill the steel's temper, rendering it unable to hold an edge. If the edge suddenly turns blue as you grind, you're cooked. The only remedy is to keep grinding and remove the soft, blued steel.

Here's how to prevent overheating. First, use the coarsest wheel on your grinder. (Fine wheels create more friction and heat than coarse wheels.) Second, set the grinder's tool rest to about 90 degrees and renew the wheel's surface with a dressing stick (**Photo 2**). This simple step is crucial: To cut fast and cool, your wheel must be clean. Keep at it

1 HOW BAD IS IT?
If the end of your chisel is nicked or rounded over, you'll need to reshape it with a bench grinder before sharpening.

2 CLEAN THE WHEEL
Press a dressing stick against your grinder's coarse wheel to remove embedded pieces of metal. A dirty wheel creates lots of friction, which can overheat and ruin your chisel.

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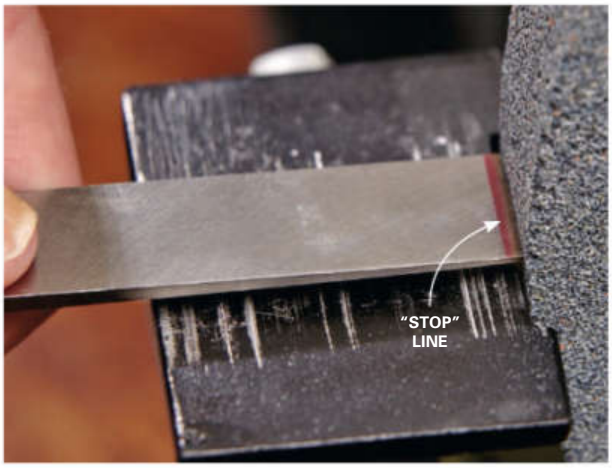


3 BLUNT THE END
Slowly push the chisel into the coarse grinding wheel to remove any nicks. Creating a blunt end will further reduce the chances of overheating when you grind a new bevel.

4 SET THE GRINDING ANGLE
Reset the grinder's tool rest to 25 degrees. A cardboard guide is accurate enough.

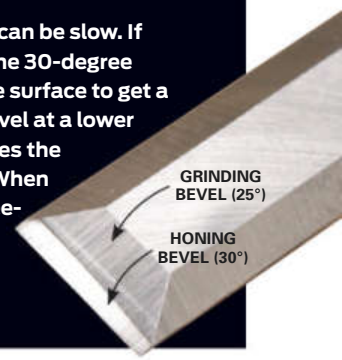
5 GRIND TO A SHARP EDGE
Grind the chisel until its blunt end is sharp. Dip the chisel in water every five seconds or so to prevent the metal from overheating.

TWO BEVELS ARE BETTER THAN ONE

A new chisel has just one bevel, usually 25 degrees. But the tool should be sharpened at 30 degrees, which creates a new bevel. Why have two bevels? It's all about saving you time and energy.

The 25-degree bevel is called the "grinding bevel"; you'll use a bench grinder to renew it. The 30-degree bevel is called the "honing bevel"; you'll use a honing stone or sandpaper to create it.

Grinding goes fast, but honing can be slow. If your chisel had only one bevel—the 30-degree one—you'd have to hone its entire surface to get a sharp edge. Creating a second bevel at a lower angle—the grinding bevel—reduces the amount of steel you must hone. When the 30-degree bevel extends three-quarters of the way up the chisel, it's time to go to the grinder and create a new 25-degree bevel.



MEET THE EXPERT

Tom Caspar apprenticed more than 30 years ago in a woodshop where hand tools were used every day, and he's been a fan ever since. He recently retired as editor of *American Woodworker* magazine.

until any shiny bits of metal embedded in the wheel are gone.

Next, draw a "stop" line across the back of your chisel with a square and felt-tip marker to indicate how much metal you need to remove. Place the chisel on the tool rest, bevel side down, and gently press its end into the grinding wheel (**Photo 3**). Don't grind any farther than you have to.

Blunting the chisel like this allows you to grind a new bevel faster. Here's why: Heat builds up rapidly on a thin edge. You must stop frequently to cool the edge by dipping it in water. Heat builds up slower on a blunt edge, so you don't have to quench it as often.

Grind a new bevel

Use a protractor to draw a 25-degree angle on a piece of cardboard, then cut the cardboard with a pair of scissors. Adjust the grinder's tool rest to this angle (**Photo 4**).

Grind the chisel until its end comes to a point (**Photo 5**). To prevent overheating, dip the chisel in a cup of water every five seconds or so. (If the water sizzles, reduce the grinding time to four seconds or less.)

The end of the chisel doesn't have to be perfectly square. Close is good enough. But it really needs to be straight—keep grinding if the edge is uneven.

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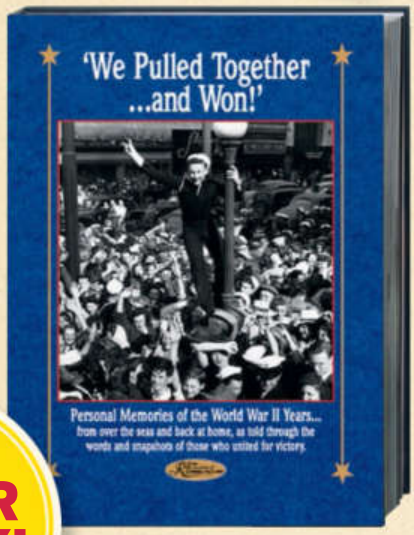

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AIR COMPRESSORS

We sorted through the specs, tried them out and found eight great models

EDITOR **GARY WENTZ** • ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **TOM FENENGA**

When you're shopping for an air compressor, the first thing you'll notice is that they're plastered with specifications: 2 hp, 3 gallon, 2.8 cfm, 130 psi, 73 dB....

But don't let all those specs confuse you. We'll tell you what they mean, what matters and what doesn't, and help you choose a compressor to suit your needs.

We tried the most widely available compressors on the market—more than 20 models—and selected eight that we thought were the best choices for DIYers. We focused on small to midsize models because they were affordable ($60 to $260) and portable, as well as powerful enough to handle the most common DIY projects.

by Tom Caspar
editors@thefamilyhandyman.com

THEY'RE NOT FOR 'HIGH-DEMAND' TOOLS

None of the compressors we tested are good partners for air-hungry tools like pneumatic wrenches, sanders or paint sprayers. For those tools, you'll need a much larger compressor.

CFM IS THE KEY

Cfm (cubic feet per minute) tells you how fast the compressor can supply air. And it's usually the most important number to consider. If a tool uses air faster than the compressor can supply it, you'll have to stop working and wait for the compressor to catch up. Every manufacturer tests its compressors at 90 psi—an average setting for a nail gun—so you can be confident that you're comparing apples to apples when you look at cfm numbers. The compressors we tested range from 0.6 to 2.8 cfm.

Tank size matters—sometimes

The compressors we chose have tanks ranging from 1 to 6 gallons. A larger tank holds more air and will allow you to use more air before the pressure drops and the motor kicks on to refill the tank. That might let you avoid stopping work while the compressor refills the tank. But remember this: When your work demands a lot of air volume, a large tank is no substitute for adequate cfm.

Psi usually isn't a factor

Most compressors provide plenty of pressure for DIY tools and tasks. In that sense, the pounds per square inch (psi) isn't much of an issue. But a higher max psi does have one real benefit: It allows a smaller tank to hold more air and perform like a bigger tank. A 2-gallon tank at 150 psi, for example, holds as much air as a 3-gallon tank at 100 psi.

Some are four times as loud as others

The compressors we chose range from 60 to 87 decibels. That may not seem like a huge difference, but it is. The decibel scale isn't like most scales you're used to. Going up 10 dB *doubles* the level of noise. A machine rated at 70 dB, for example, is twice as loud as one rated at 60 dB. An 80-dB machine is four times as loud. So a small reduction in decibels goes a long way in making a machine more pleasant to operate.

Portability isn't just about weight

Weight isn't the only factor in determining whether a compressor is easy to carry. Shape matters too. Slim units are the easiest to tote; wide ones are the most awkward. We've noted the best and the worst in our reviews.

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ENOUGH POWER FOR NAILERS?

All of the compressors we tried deliver enough pressure (psi) and volume (cfm) for trim nailers.

Framing nailers are another story. All of the compressors except one (Central Pneumatic 95275) provide enough pressure for framing nailers (typically about 120 psi). But only the ones with ratings of about 2 cfm or higher will keep up with a framing nailer when you're working at moderate speed. Those with lower cfm ratings will require patience; you'll drive a few nails, then wait for the compressor to catch up.

Oil-free is the norm

Almost all small compressors are now "oil-less," which means you never have to worry about checking or changing oil. Oil-less compressors generally wear out faster than oil-lubricated models, but that's not likely to be an issue with normal DIY use.

Ignore horsepower

To get the best read on the amount of air power a compressor can deliver, look at its cfm, not its horsepower.

OTHER FEATURES TO LOOK FOR

- Ball valve drain. Water that condenses in a compressor's tank leads to rusting and pinhole leaks. To prevent this, manufacturers recommend that you drain the tank regularly. All tanks have drains, but there are two different types. The simplest is a drain cock, which is awkward to use, and you may even need a pliers. We prefer a ball valve drain, which works like a faucet.
- Cord wrap. Most compressors provide a convenient way to wrap up the power cord for easy carrying.
- Two outlets. Most compressors have a single outlet for connecting an air hose, but a few have two, which lets you and a buddy work together.
- Kits and accessories. For extra value, look for compressors that come with a hose or a set of inflation accessories. Some may be bundled with a nail gun and hose under a different model number.

Shrouding prevents damage

One of the benefits of a small compressor is that you can take it virtually anywhere. The downside is that it's likely to get battered. The tank will be fine, but the gauges and outlets are vulnerable unless they're protected. Some of the machines we tested go all in: They're built with a case that surrounds the entire machine. Others leave some parts unprotected.

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COMPRESSOR ROUNDUP

We began with a couple dozen models, then narrowed the field to these eight. Each has at least one trait that makes it worth considering, whether you're looking for power, weight, low noise or just a good deal on a good compressor.

The Family Handyman EDITORS' CHOICE

Editors' Choice: Best Lightweight

SENCO NO. PC1010N

Light, quiet and loved by pros

This is an upgraded model based on the PC1010, which is a favorite among trim carpenters. The gauges are shrouded, but other parts are exposed.

$155 • 0.7 cfm • 21 lbs. • 68 dB • 1-gal. tank • 135 max psi

PORTER-CABLE NO. C2004

Smaller, quieter and lighter

It looks a lot like its sister, the C2002, and carries the same cfm rating—but it's better in terms of weight, size and noise.

$180 • 2.6 cfm • 29 lbs. • 75.5 dB • 4-gal. tank • 165 psi • Cord wrap • Ball valve drain • 2 outlets

CRAFTSMAN NO. 16574

Easy to store

This model can be stored upright or flat; either way, its gauges and outlet are well protected. Light and easy to carry, it includes inflation accessories and an inflation hose pre-connected to a second outlet.

$125 • 1.8 cfm • 19.6 lbs. • 73 dB • 1.2-gal. tank • 135 max psi • Cord wrap • Ball valve drain • 2 outlets

HUSKY NO. 4610A

Large tanks and low noise

Notably quiet, this model stores lots of air in its corrosion-resistant aluminum tanks. It's large, relatively heavy and not fully shrouded.

$199 • 2.1 cfm • 44 lbs. • 68 dB • 4.6-gal. tank • 125 max psi • Ball valve drain • 2 outlets

The Family Handyman EDITORS' CHOICE

Editors' Choice: Lowest Noise

CALIFORNIA AIR TOOLS NO. 2010A

Powerful, but super quiet

By far the quietest machine we tested, this unit features a corrosion-resistant aluminum tank. This model is also the most expensive in our group, but the manufacturer claims its motor will last six times longer than that of similar models. The gauges and outlet aren't shrouded.

$260 • 2.2 cfm • 35 lbs. • 60 dB • 2-gal. tank • 120 max psi • Ball valve drain • 2 outlets

CENTRAL PNEUMATIC NO. 95275

Bargain priced

This model is very light and easy to tote, but it's quite noisy. Its low maximum pressure is fine for most nailing jobs, but you may not be able to drive large nails all the way into hard materials.

$60 • 0.6 cfm • 21 lbs. • 87 dB • 3-gal. tank • 100 max psi • Cord wrap

The Family Handyman EDITORS' CHOICE

Editors' Choice: Best Value

PORTER-CABLE NO. C2002

High performance, great price

Delivering plenty of cfm at the lowest cost in its class, this model has been a best seller for many years. It's well shrouded, nicely balanced and fills up quickly; not extremely loud or too heavy.

$140 • 2.6 cfm • 30 lbs. • 82 dB • 6-gal. tank • 150 max psi • Cord wrap • 2 outlets

BOSTITCH Trim-Air NO. CAP1512-OF

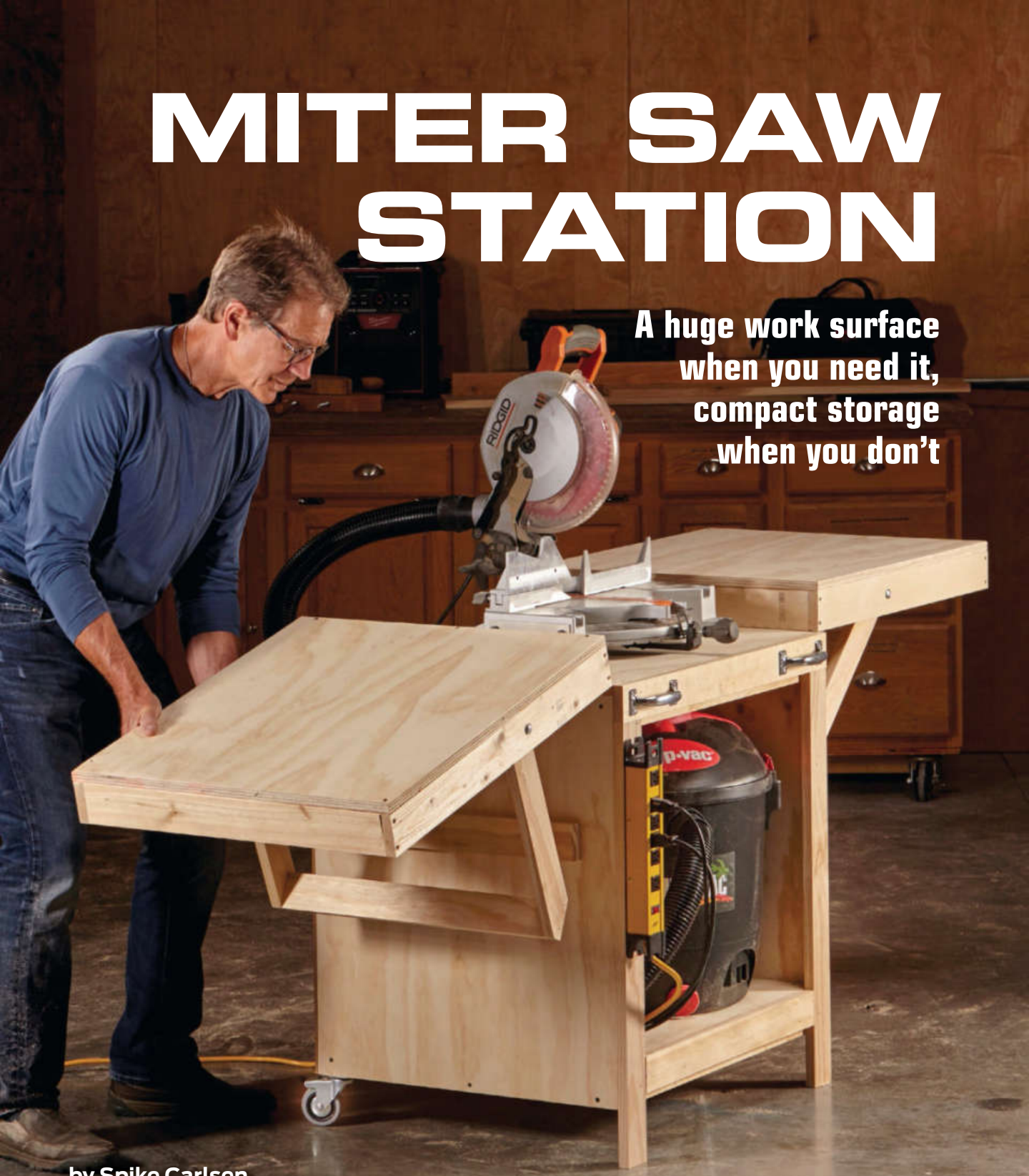
Big power in a small package

The high cfm, compact size and sturdy roll bars make this a great compressor. The manufacturer doesn't provide a dB rating, but we found it louder than most other models.

$135 • 2.8 cfm • 23.5 lbs. • dB not given • 1.2-gal. tank • 150 max psi • Cord wrap • Ball valve drain

MITER SAW STATION

A huge work surface when you need it, compact storage when you don't



by Spike Carlsen
editors@thefamilyhandyman.com

Storing a miter saw can be tough. Most people don't have the space to leave it set up with long support tables. Storing it under the workbench is a pain: You gotta dig it out, set it on sawhorses and then figure out how to prop up stuff while you're cutting. A high-end manufactured stand is great—but probably costs as much as your miter saw. So what are you going to do? Build this simple miter saw cabinet!

5 FANTASTIC FEATURES

- The support wings, when extended, give you 7 ft. of working room. When closed, the cabinet takes up only 33 in.
- The casters in back allow you to easily move the cabinet, while the legs in front keep it rock-solid when you're using the saw.
- There's a convenient space for your shop vacuum—super handy if that's your miter saw dust collector.
- There's plenty of storage space for blades, wrenches and other miter saw gear.
- At under $100, it costs far less than most store-bought stands—and has features they don't.

Build four frames and assemble the cabinet

The heart of this miter saw stand is four frames: the top, bottom and two wings. They're all the same length and width, BUT the top and bottom boxes are made from 1x3s (A, B) while the two wings are made from 1x4s (C, D) ripped to width based on the height of your miter saw's table. To determine the width of those boards, measure the height of your miter saw's table, then subtract 3/4 in. (the thickness of the plywood wing panels). Use a table saw or a circular saw and guide to rip those boards to width.

Cut the boards to length on a miter saw (don't you wish you had a convenient place to do that?), then use glue and screws to assemble the frames (**Photo 1**). Predrill holes at the ends of the long frame sides (A) so they don't split when screws are installed.

WHAT IT TAKES

TIME: 1 day
COST: $100
SKILL LEVEL: Intermediate
TOOLS: Drill/driver, circular saw and miter saw

1 BUILD FOUR FRAMES
One will form the top of the cabinet and another will form the bottom. The two wing frames must be sized to suit the height of your miter saw's table.

2 CUT THE PLYWOOD PANELS
With homemade saw guides, perfect cuts are a cinch. To make your own guides, search for "saw cutting guide" at familyhandyman.com.

3 ASSEMBLE THE CABINET
Secure the side panels to the top and bottom frames using screws and glue.

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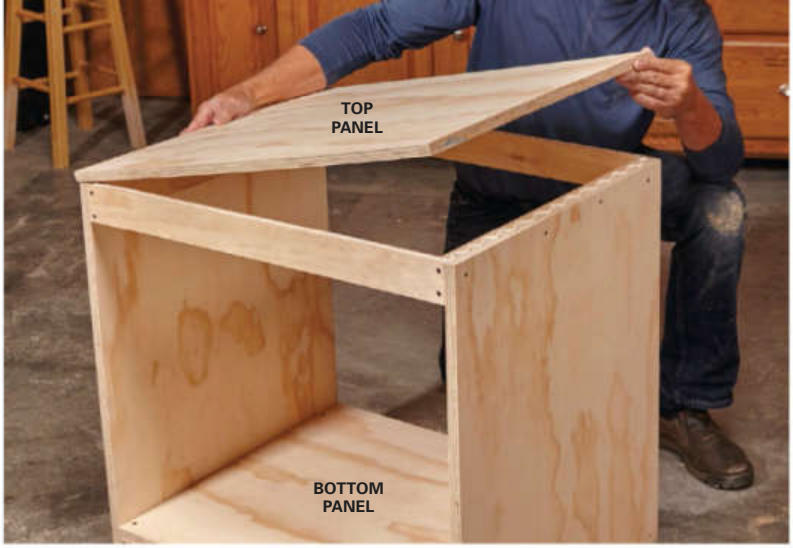
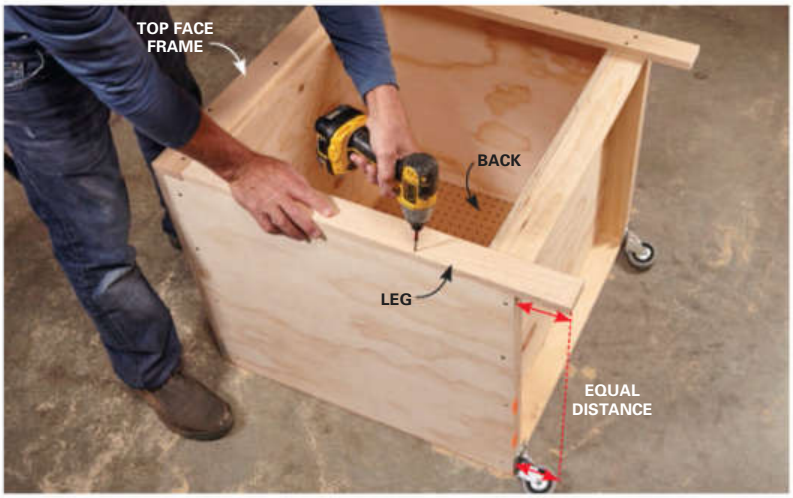
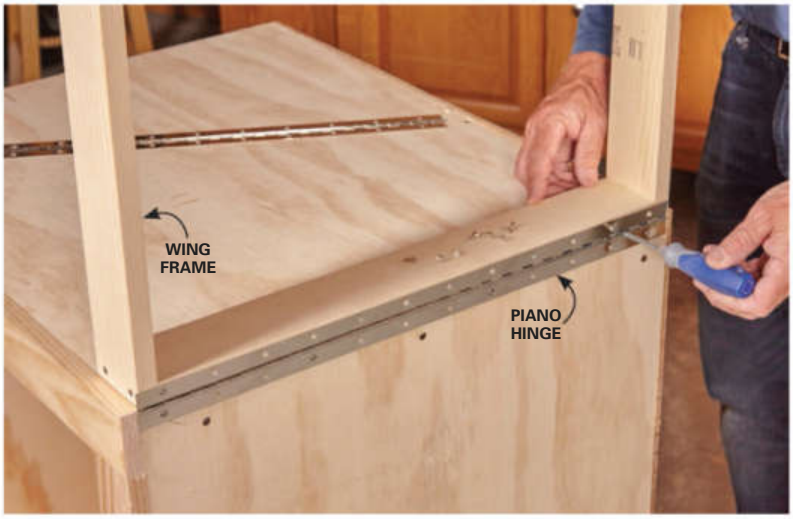


4 ADD THE TOP AND BOTTOM PANELS
Carefully align the panels with the edges of the frames to ensure that the cabinet is square.



5 ATTACH THE FACE FRAME
Cut the face frame legs so they extend beyond the bottom of the cabinet the same distance as the casters. Also install the cabinet's back.



6 SECURE THE WINGS
Install the hinges with the wing positioned as shown to give you the right hinge height.

Use a saw guide to cut your plywood. To see how to make a guide, go to familyhandyman.com and search for "saw cutting guide." All the parts are 24 in. wide, so begin by ripping a full sheet down the middle. Cut the two side panels (E) as shown in **Photo 2**. Position the top and bottom frames on the floor and install the sides (**Photo 3**) using glue and screws. Cut and install the bottom (F) and top (G) panels as shown in **Photo 4**.

Cut the back (M) to size and install it. Make sure the cabinet is square while securing the back. We used pegboard to allow better air circulation (and maybe even provide a little extra storage space), but you can use any type of panel that's at least 1/4 in. thick.

Give it wings and feet

Turn the cabinet upside down and install the two back casters. Use swivel or fixed versions depending on your needs. Lay the cabinet on its back and install the top face frame (J). Install the two face frame legs (K) as shown in **Photo 5**, cutting them so they extend past the bottom of the cabinet the same distance as the casters (in our case, 3-3/4 in.) Finally, install the bottom face frame (L), keeping it flush with the top of the plywood so the inside of the cabinet is easy to sweep out.

Secure the "wing frames" to the cabinet using 24-in. piano hinges (**Photo 6**). Set the wing frames on the cabinet while installing the hinges to give you the right hinge position (you want the hinge knuckle flush with, or slightly above, the top of the plywood). Cut the wing brackets (N) and rungs (P), then nail them into a U-shape. Drill 3/8-in. holes through the wing brackets and 5/16-in. holes in the sides of the wing frames as shown in **Figure A**, then connect them with 2-in. bolts (**Photo 7**). Install the wing panels (H) using glue and screws.

Lift the wings and support them in the open position by clamping

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two straight 2x4s to them as shown in **Photo 8**. This will give you the approximate correct "in-use" position for the wings. Swing the wing brackets against the side of the cabinet and mark a line along the bottom (**Photo 8**). Swing the supports out of the way and install the cleats 1/4 in. above these marks; this extra 1/4 in. gives the wings the lift needed to create a flat surface. Periodically check the wings to make sure they're even with each other and adjust the cleats up or down as necessary.

7 MOUNT THE BRACKETS
Cut the wing brackets and position the holes as shown in Figure A (p. 44).

8 POSITION THE CLEATS
Secure the wings in the raised position using straight 2x4s and clamps, then mark the bottoms of the brackets. Position your cleats 1/4 in. above this mark.

Final touches

Apply two coats of polyurethane to protect the wood, if desired. Cut a hole in the back of the cabinet for your shop vacuum hose and cords. Secure the handles to the front for moving the cabinet. Secure a power strip to the face frame so you can plug your saw, vacuum and even a work light into one convenient place.

9 ACCESSORIZE YOUR CABINET
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Figure A
Exploded view

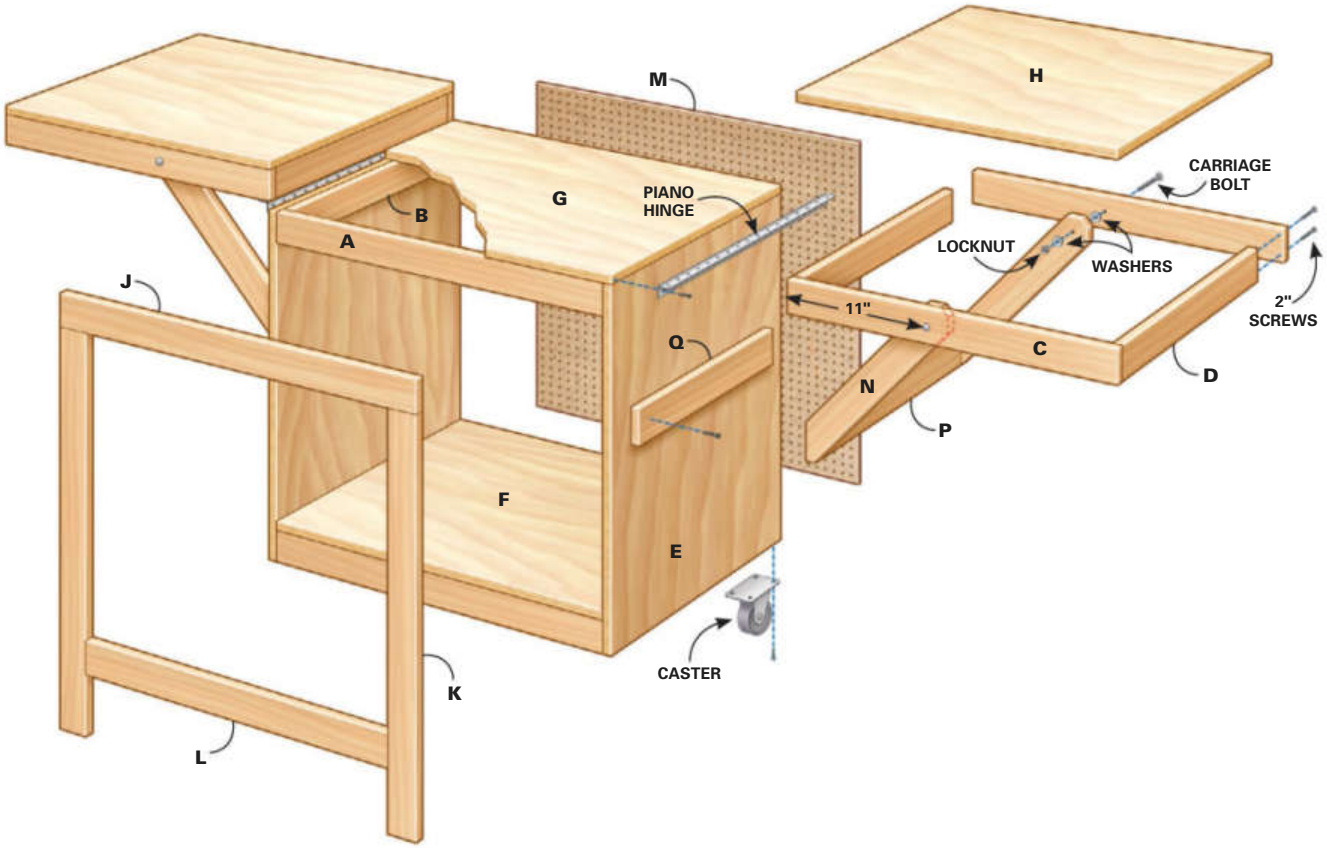
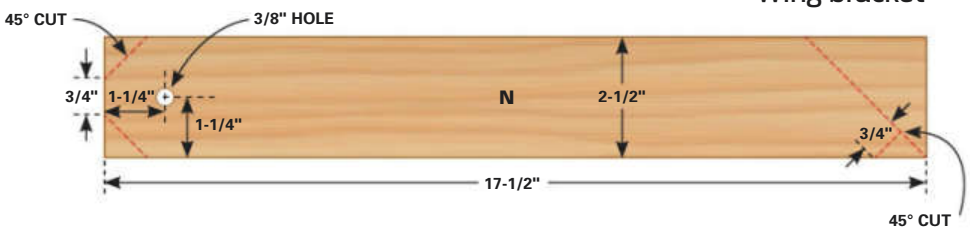


Figure B
Wing bracket



Cutting List

KEY	QTY.	DIMENSIONS	NAME
A	4	3/4" x 2-1/2" x 28"	Long frame sides
B	4	3/4" x 2-1/2" x 22-1/2"	Short frame sides
C	4	3/4" x (cut to width)" x 28"	Long wing sides
D	4	3/4" x (cut to width)" x 22-1/2"	Short wing sides
E	2	3/4" x 24" x 28" plywood	Side panels
F	1	3/4" x 24" x 28" plywood	Bottom panel
G	1	3/4" x 24" x 29-1/2" plywood	Top panel
H	2	3/4" x 24" x 28" plywood	Wing panels
J	1	3/4" x 2-1/2" x 29-1/2"	Top face frame
K	2	3/4" x 2-1/2" x 30" *	Face frame legs
L	1	3/4" x 2-1/2" x 24-1/2"	Bottom face frame
M	1	1/4" x 28-3/4" x 29-1/2"	Back
N	4	3/4" x 2-1/2" x 17-1/2" **	Wing brackets
P	2	3/4" x 2-1/2" x 20-7/8"	Wing bracket rungs
Q	2	3/4" x 2-1/2" x 18"	Cleats

NOTES:
* May vary based on height of casters
** Measured to long point (see Figure A)

Materials List

ITEM	QTY.
3/4" x 4' x 8' plywood	1
1/4" x 4' x 4' pegboard	1
1x4 x 10' pine	2
1x3 x 10' pine	4
24" piano hinges	2
Casters (3-3/4" height)	2

5/16" x 2" carriage bolt (4); 5/16" washers (8); 5/16" locknuts (4); 3-3/4"-tall casters (2); 2" screws; 1-1/4" and 1-5/8" screws; wood glue

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Perfect COPED JOINTS

Make trim fit tight now —and stay tight forever

by Spike Carlsen
editors@thefamilyhandyman.com

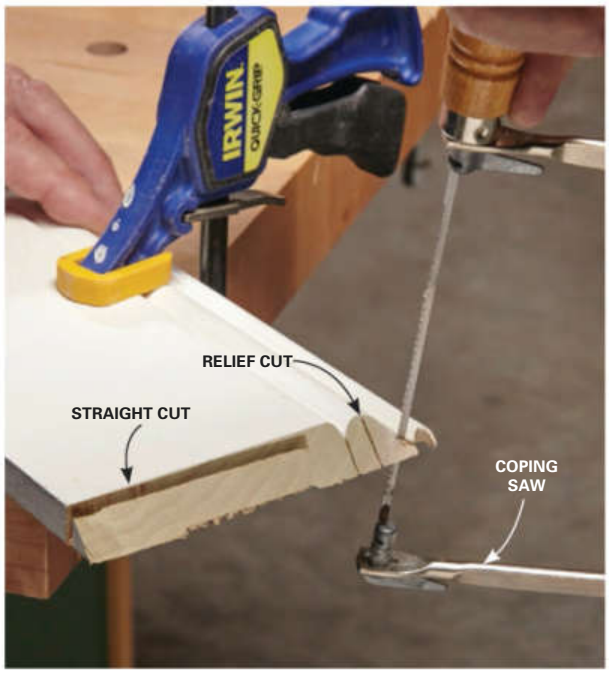
The first time I saw a fellow carpenter cope baseboard molding, I thought: "Why's he messing around with that fancy-pants cut when two 45-degree cuts would do the job waaaay faster?" But after I spent 25 minutes trying—and failing—to make 45-degree cuts meet perfectly, coping started to make sense.

Since then, I've coped hundreds of corners when installing baseboards, chair rails and crown molding. I've found that—with just a little practice—it's actually faster than fussing with miters. More important, corners look better and stay tight longer.

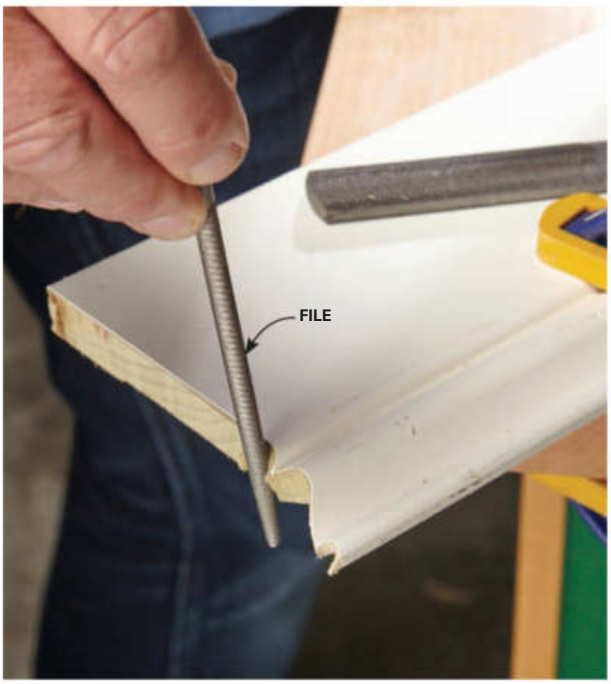
THE BASIC PROCEDURE

Since the most commonly coped molding is baseboard, we'll use that as our example. Begin by butting the side that won't be coped into the corner and nail the baseboard in place. Now you're ready to cope the other baseboard. There are four basic steps:

1 MAKE A MITER CUT
The 45-degree cut will—through the magic of geometry—provide a perfect profile to guide your coping cut. When you make the miter cut, leave the baseboard a couple inches too long. You can cut it to final length after the coping is done.



2 CUT THE COPE
Follow the profile created by the miter cut. Relief cuts at tight turns allow waste to fall away and your saw to make turns more easily. You can make straight cuts faster and better with a miter saw (more on that later).



3 FINE-TUNE THE COPE
Your coping cut doesn't have to be perfect. Even the best trim carpenters use files, rasps and sandpaper to clean up their cope cuts. Tight curves, for example, are almost impossible to cut with a coping saw. But a small file rounds them easily.

4 TEST THE FIT
Keep a scrap of the trim handy so you can check the fit as you fine-tune the cope. With really complex profiles, you may have to check and fine-tune the fit a dozen times before you get it right.

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **PAUL NELSON and HSP**

COPIOUS COPING TIPS

You can make perfectly fine copes using just a miter saw, coping saw and file. But there are ways to speed up the process without sacrificing accuracy. In fact, you can increase accuracy and work faster.

Start out straight up

Baseboard often tilts inward at the bottom because of the drywall's tapered edge. And that makes coping tricky. To avoid trouble, make sure the baseboard sits square to the floor. If it tilts, remove it and drive a screw into the framing near the floor. Leave the screw head slightly proud so it holds the baseboard away from the wall. Then check again with your square. You may have to turn the screw in or out a little to get the baseboard to stand straight up.

Brighter is better

With good lighting, you'll get faster, better results. So take a minute to set up a work light or move your workstation near a window.

Clamp it down

Coping thin, floppy trim is like doing dental work on a snake. A clamp or two will hold your work steady and your result will be much more precise.

Coping saw setup

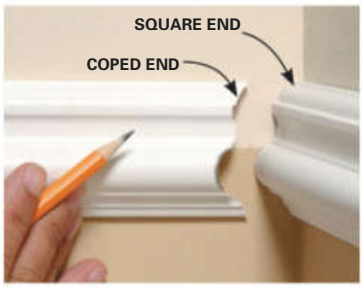
If you're using your grandpa's coping saw—well, actually any coping saw—do three things:

1. Replace the blade if it's rusted or worn. Blades can have anywhere from 10 to 20 teeth per inch; use one with at least 15.

2. Make sure the teeth point at the handle; coping saws are designed to cut on the pull stroke (though some carpenters use them backward).

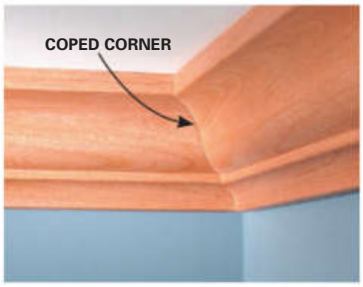
3. Make sure the blade has proper tension. Adjust the tension by rotating the handle clockwise or counterclockwise.

COPING QUESTIONS ANSWERED



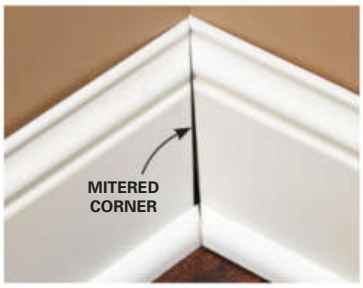
What's a coped corner?

In a coped corner, one molding has a square cut on the end that butts up against the wall. The other molding has a coped cut that fits perfectly against the face of the first molding.



Why do it?

A coped corner fits tightly, even if the walls are out of square (and they usually are). Coped trim also stays tight—even when the wood shrinks, the walls shift or the vacuum cleaner whacks it.



Why not miter?

Cutting both pieces of trim at 45 degrees makes sense in theory. But in the real world, two walls rarely form a perfect 90-degree angle. So getting two miters to meet tight and right is challenging or impossible. And even if you get it tight, the joint will probably open as wood naturally shrinks or swells. Coped corners take these elements out of play.

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Cope straight with a miter saw

Cut the "straightaway" with a miter saw for a faster, straighter cope. Turn the molding upside down, set your saw at least 5 degrees to the right and cut straight down until you hit the curvy part. Some pros even nibble away at curved profiles with a miter saw.

Prevent splintering

Coping cuts often create thin, pointy tips on the trim. Support those tips with your finger as you cut, file or sand to prevent them from splintering off.

Getting started

When starting a cut, make a few light pull strokes to create a groove before you saw away in earnest. On really hard woods like maple, your blade might skid off the mark. In that case, cut a tiny starter notch with a utility knife.

Always 'back bevel'

If you look closely at these photos, you'll notice that all the cope cuts are made at an angle. That leaves a pointed edge along the profile. And that pointy edge has a few advantages: First, it allows the cope to fit tightly in out-of-square corners. Second, sanding or filing the cope is easier because you have less material to remove. Finally, that pointy edge will crush inward a little when forced against the adjoining trim, so you'll get a tight fit even if the cope isn't perfect. The best angle for a back bevel varies. On baseboard, 5 degrees is often enough. On crown molding, shoot for 45 degrees or more.

Don't worry about your backside

Remember: The face of the trim is all you care about. Don't be afraid to hack away the back with steep back bevels or ugly cuts from different angles. An ugly back side often means a good cope.

Highlight the profile

If you can't see the profile clearly, rub your pencil across it to create a perfect guideline.

Cope with a jigsaw

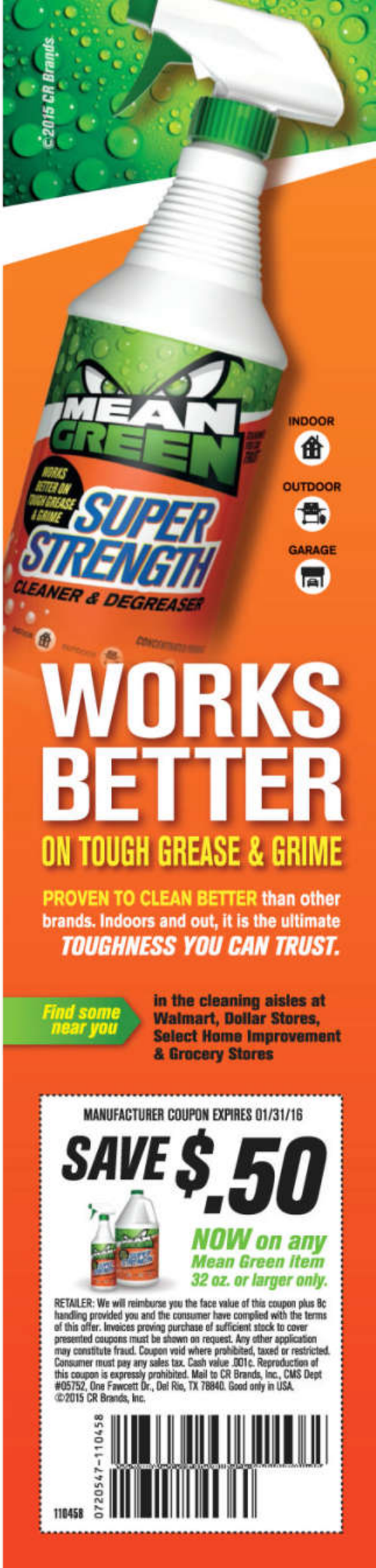
A narrow, fine-tooth blade cuts curves much faster than a coping saw. It's also a fast way to wreck your cope. So practice on scraps before making real cuts.

Sculpt the cope

Tools that match the curves of a profile make coping faster and better. On complex profiles, I sometimes use a file, rasp, rotary tool or dowel wrapped with sandpaper—or all of the above.

Cope with a belt sander

With simple ranch-style moldings, you may not need a coping saw at all. Cut the straight section with a miter saw, then cope the curve with the rounded nose of a belt sander. Belt sanders also help out on some styles of crown molding.



SHALLOW DRAWER CHEST

Perfect for tools, jewelry or crafts

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA** and **PAUL NELSON** • ILLUSTRATION **FRANK ROHRBACH III**

by Dave Munkittrick
editors@thefamilyhandyman.com

The trouble with standard drawers is that they're too deep for small stuff, so you end up with a heap—and the thing you need is always buried at the bottom. That's why I designed this chest. The shallow drawers keep small items organized and easy to find.

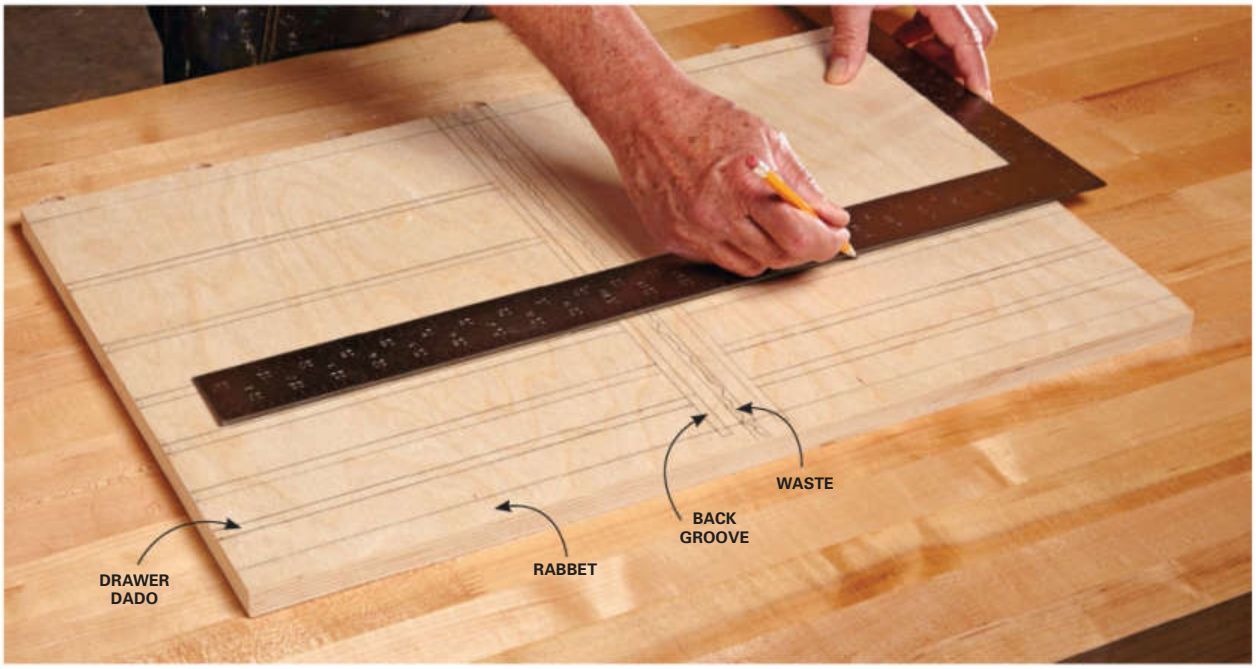
Aside from easy storage, this chest is also easy on a woodworker's wallet. Since the parts are small, you might be able to build it entirely from scrap plywood.

ONE DESIGN, MANY USES

This chest provides what most furniture and cabinets don't: lots of shallow drawers that are perfect for small items like tools and jewelry or craft and hobby gear. The basic design is versatile—you can easily modify the chest and drawers to suit your stuff.

Build the chest box

Start with the sides (A), but don't cut them to size right away. Instead, cut a single piece of plywood large enough for both sides. Mark out the rabbets and dadoes with the sides back to back and a 1/2-in. gap



1 MARK BOTH SIDES AT ONCE
To save time and avoid mistakes, mark all the router cuts on a single slab of plywood. After marking and routing, you'll cut the sides from this slab.

2 ROUT THE RABBETS
Cut the top and bottom rabbets using a guide and a pattern bit. The guide shown here is two layers of 1/2-in. plywood glued together.

3 CUT THE DADOES
Using a straight bit and guide, rout the back grooves and the drawer dadoes. Be sure to stop each drawer dado when you reach the back groove. After routing, cut the chest side to final size.

4 ASSEMBLE THE BOX
Glue and clamp the sides to the bottom. Then slip the back into place and add the top. Cauls spread the clamping pressure along the joint for a tight fit.

between them (**Photo 1**). Then rout the rabbets at the top and bottom of the sides (**Photo 2**). I used a pattern bit ($15 and up) for the rabbets. With a pattern bit, you can simply clamp a guide exactly where you want the rabbet and the bit will follow the guide perfectly. Pattern bits come in various sizes. Any size will work for this job, since you'll have to cut in multiple passes anyway.

Next, rout the dadoes and grooves (**Photo 3**). You'll need a 1/4-in. straight bit for the back groove and a 5/16-in. straight bit for the drawer dadoes. Pattern bits don't come in small diameters like these, so I had to switch strategies. Instead of placing the guide directly along each mark, I measured from the edge of the router base to the bit and placed the guide that distance from the dado location. This isn't difficult, but it adds some time and fuss to the job. When you cut the back grooves, make them a hair shallower than the rabbets you cut earlier—if you go too deep, the grooves will show through the top of the chest. Be sure to rout the back grooves in the top and bottom (B) as well. When you cut the drawer dadoes (**Photo 3**), slow down as you approach the back grooves. You don't want to cut past the back grooves. With the machining done, rip the two sides to width and cut the back (U).

Now you're ready to glue and clamp the chest box (**Photo 4**). You might be tempted to use brad nails, but don't. The edges will be routed with a round-over bit. Nails and router bits don't mix well. Once the glue has set, round the edges (**Photo 5**) with a 3/8-in. round-over bit.

Build the drawers

Cut the 1/4-in. MDF bottoms (V, W) to size on the table saw. Test-fit the bottoms into each dado (**Photo 6**). The lower drawer bottom (W) rides on the bottom of the chest, so it's

cut to fit inside the chest opening. Cut the drawer box parts (C – M). Assemble the boxes with No. 6 trim-head screws. Be sure to drill pilot holes or you may split the plywood.

Attach the boxes to the bottoms. It's best to do these one at a time starting at the top and working your way down. Position the drawer bottom in the dado with the drawer box set loosely on top. Align the bottom and the box so both are centered in the opening and flush at the front edge. Pull the drawer out a bit. Take care not to disturb the position of the box relative to the bottom. Shoot a couple nails through the bottom into the drawer box front to hold it in place. Remove the entire drawer assembly, turn it over and fasten the drawer bottom with screws (**Photo 7**).

Add the drawer front

Machine the drawer fronts (N – T) from a single plywood blank (15-1/4 x 16-1/4 in.). Rout a 3/8-in. round-over around all four edges. Then cut each front from the blank one at a time (**Photo 8**). Starting at the bottom, position each front using a 1/16-in. spacer. Make sure the front evenly covers both drawer runners. Secure with a clamp and attach the fronts with 3/4-in. screws (**Photo 9**).

For drawer pulls, I used knobs in three sizes matched to the varying drawer depths. To finish the chest, I sanded with 120-grit paper, followed by 220. Then I gave it four quick coats of wipe-on polyurethane.

WHAT IT TAKES

TIME: One weekend
COST: $80 or less
SKILL LEVEL: Intermediate
TOOLS: Drill/driver, table saw, router and bits, clamps, basic hand tools

5 ROUND THE EDGES
For most of the edges, the router can ride on the outer faces of the chest. But you can't do that on the front edges of the sides; the bearing would dip into the drawer dadoes and ruin the edge. So instead, rout as shown here. For stability, screw a 2x2 inside the box.

6 TEST-FIT THE DRAWER BOTTOMS
Make sure they slide easily in each dado and are flush with the front of the chest.

7 BUILD THE DRAWERS
Assemble the drawer boxes, then fasten the bottoms. Drill pilot holes and use short, skinny screws (No. 4 x 3/4 in.) to avoid splitting the plywood.

Figure A
Shallow drawer chest

Overall dimensions: 16" tall x 16" wide x 12-1/4" deep

Materials List

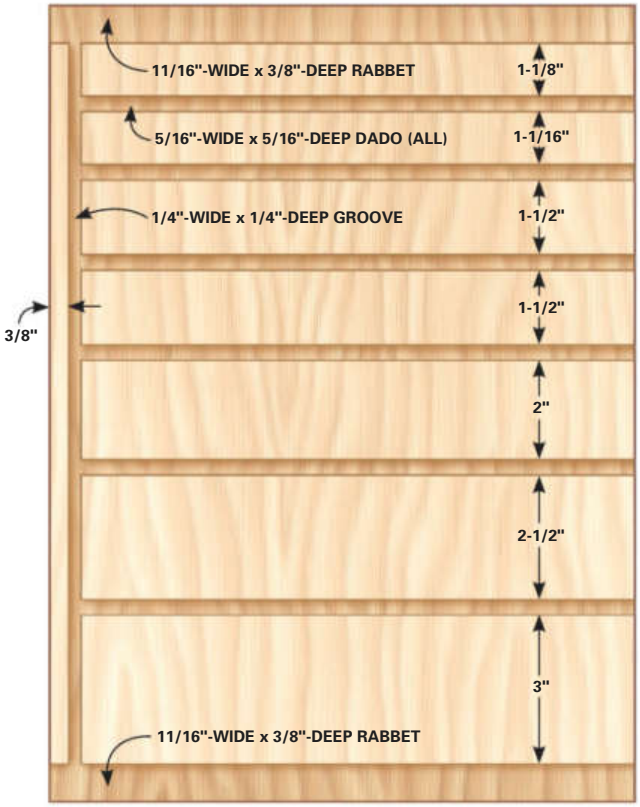
ITEM	QTY.
3/4" plywood, 2' x 4'	1
1/2" plywood, 2' x 4'	1
1/4" plywood, 2' x 4'	1
1/4" MDF, 4' x 4'	1
1/4" plywood, 2" x 15"	1

Wood glue, No. 6 x 1-1/4" trim-head screws, No. 4 x 3/4" screws, No. 8 x 3/4" screws, 120- and 220-grit sandpaper, wipe-on poly. We used cast steel knobs from leevalley.com: six of item No. 01W47.01; two of item No. 01W4702; one of item No. 01W4703.

MEET THE BUILDER

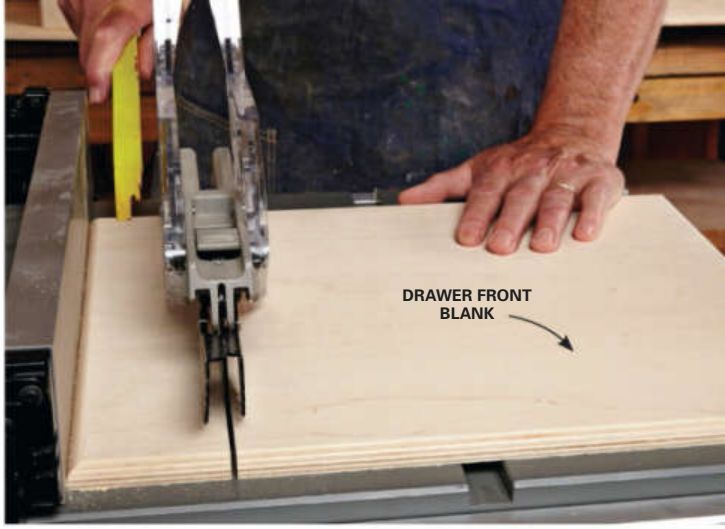
David Munkittrick, a former editor of *American Woodworker* magazine, is a professional furniture maker based in Wisconsin.

Figure B Side detail



Cutting List

KEY	QTY.	DIMENSIONS	NAME
3/4" BIRCH PLYWOOD			
A	2	11-3/4" x 16"	*Sides
B	2	11-3/4" x 15-1/4"	Top and bottom
* Start with a single 24" x 16" piece of plywood for (A)			
1/2" BIRCH PLYWOOD			
C	2	2-5/8" x 14-3/8"	Drawer box front/back
D	2	2-5/8" x 10-1/8"	Drawer box sides
E	2	2-3/8" x 14-3/8"	Drawer box front/back
F	2	2-3/8" x 10-1/8"	Drawer box sides
G	2	1-7/8" x 14-3/8"	Drawer box front/back
H	2	1-7/8" x 10-1/8"	Drawer box sides
J	4	1-3/8" x 14-3/8"	Drawer box front/back
K	4	1-3/8" x 10-1/8"	Drawer box sides
L	4	7/8" x 14-3/8"	Drawer box front/back
M	4	7/8" x 10-1/8"	Drawer box sides
N	1	2-15/16 x 15-1/4"	Drawer front**
P	1	2-3/4" x 15-1/4"	Drawer front**
Q	1	2-1/4" x 15-1/4"	Drawer front**
R	2	1-3/4" x 15-1/4"	Drawer fronts**
S	1	1-5/16 x 15-1/4"	Drawer front**
T	1	1-3/8" x 15-1/4"	Top drawer front**
** Cut from a single piece of plywood 15-1/4" wide x 16-1/4" tall			
1/4" BIRCH PLYWOOD			
U	1	15-1/8" x 15-1/8"	Back
1/4" MDF			
V	6	11-1/8" x 15-1/8"	Drawer bottom
W	1	11-1/8" x 14-1/2"	Lower drawer bottom
1/4" PLYWOOD			
X	1	2" x 14-9/16"	Spacer



8 CUT THE DRAWER FRONTS
Cut a drawer-front blank and round all four edges with a 3/8-in round-over bit. Then cut the drawer fronts. A single piece of plywood gives the drawer fronts a matching grain pattern.

9 MOUNT THE DRAWER FRONTS
Position each drawer front with a spacer and clamp it. Then remove the drawer and fasten the front with screws driven from inside the drawer.

10 ADD THE KNOBS
After finishing, install the knobs on the center of each drawer to complete your chest.

BORN AND BRED IN THE USA

EDITOR **MARK PETERSEN** • ART DIRECTION **MARCIA ROEPKE**

Every year, we dedicate a few pages to celebrate the folks who invented, introduced or improved those products that we DIYers hold so dear. We salute the American ingenuity and industriousness that simplified our household chores and repairs, and in some cases, made them kind of fun.

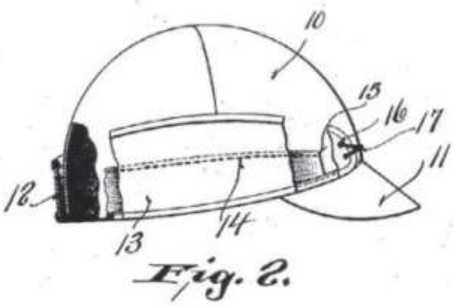
STORMY KROMER

STORMY KROMER

A cap that stayed on

George Kromer (nicknamed "Stormy" for his blustery temper) was a semipro baseball player, but his future father-in-law insisted he get a real job before marrying his daughter. Stormy joined the railroad and married Ida. In 1903, Stormy was frustrated at repeatedly having his caps blow off his head, so he went home and instructed Ida to sew an ear band onto one of his old wool baseball caps. The next day, all his co-workers wanted one, and the Kromers were in business.

The caps were sewn in such a way that six panels of fabric met at the top, and they became so popular that "six-pointer" became synonymous with Midwest railroad workers. The Stormy Kromer cap is currently made in Ironwood, MI.



Above: Stormy and Ida Kromer. Left: The original patent application.

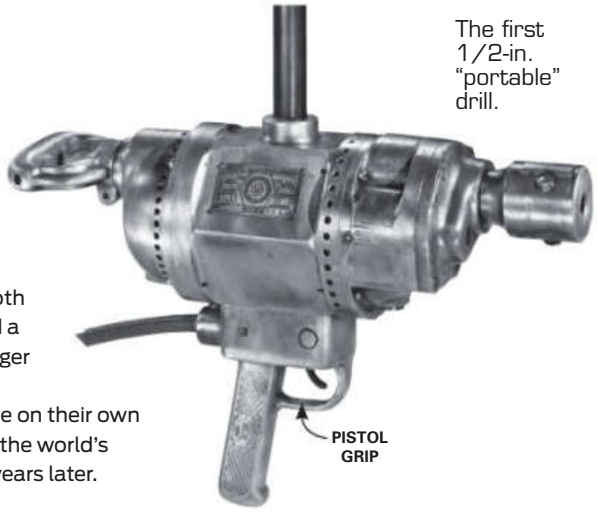
Black & Decker

First portable electric drill

IIn 1910, Duncan Black and Alonzo Decker opened a small machine shop in Baltimore. They began building machinery—automated candy dippers, machines that made bottle caps and parts for other manufacturers.

While sitting at Al Decker's kitchen table, the two men thought about a lighter and easier-to-use industrial drill. (A Colt automatic pistol lay on the table—Colt was a customer.) Legend has it, they both looked at the gun and had a "eureka" moment. In 1917, they received a patent for the first 1/2-in. portable electric drill, equipped with a trigger and pistol grip, remarkably similar to the Colt.

Factory workers loved the tool and often brought one home to use on their own houses. Black & Decker saw an opportunity and in 1946 introduced the world's first portable drill for consumers. They sold their millionth drill five years later.



The first 1/2-in. "portable" drill.

BLACK & DECKER

MAZE

Maze nails

From freebie to industry leader

Maze workers hand-dipped steel nails into molten zinc until automation took over in 1955.

Samuel Nesbitt Maze entered the lumber business in 1848 and sold high-quality cedar shingles. Trouble was, the steel nails of the time didn't last nearly as long as the shingles. So Samuel's son Walter bought a used nail machine to produce zinc nails. At first, they gave these rust-proof nails away to customers who purchased the rest of their roofing materials at Maze Lumber.

When the price of zinc skyrocketed in the early 1900s, Maze developed a system for dipping steel nails into vats of molten zinc. These ZINCLAD nails were even more popular with carpenters because they were harder than zinc and still rust resistant. Today, Maze has the world's largest variety of specialty nails, and after 167 years, the lumberyard is still in business!

MAGLITE

The first Maglite.

Maglite

'The Cadillac of flashlights'

Tony Maglica was born in New York during the Great Depression. He and his mother moved back to her native Croatia while he was a small child. Tony escaped the Communist-ruled country in 1950 and returned to the United States. He started a machine shop and earned a solid reputation for producing high-quality parts for the military and aerospace industries.

In 1979, he introduced the Maglite flashlight made from aircraft aluminum. He marketed the flashlights to police and firefighters, who loved them. It turned out that the general public was also more than willing to pay a premium for "The Cadillac of Flashlights." Mag Instruments has won many design awards over the years and currently produces dozens of different products, every one of them in the United States.

LUTRON

Weber grills

Born from a buoy

The classic round Weber grill sort of looks like the bottom of a marine buoy. That's because the first Weber grill was made from the bottom of a marine buoy! George Stephen Sr. worked at Weber Brothers Metal Works in Chicago, which made buoys for the coast guard. In 1952, George had a brilliant idea: He cut the bottom off one of the buoys and added a vent and handle to the top and three legs to the bottom. His neighbors laughed at his contraption at first, but soon wanted one of their own. And so did the rest of the world! Weber grills, made in Illinois, are sold in more than 72 countries.

WEBER

The original Weber grill.

1964 version of the Lutron dimmer switch.

LUTRON

Chalk one up for the little guy

Back in the 1950s, light-dimming switches were bulky commercial affairs that generated a lot of heat. Joel Spira, a physicist from New York City, knew he could build a better one. He worked in a small lab set up in a spare bedroom of the apartment where he lived with his wife, Ruth. In 1959, he was successful at creating a solid-state, rotary dimmer that used less energy, created less heat, and was small enough to fit in a standard electrical box. Almost as impressive, he was able to sell his product in a market dominated by giant manufacturers such as GE and Westinghouse.

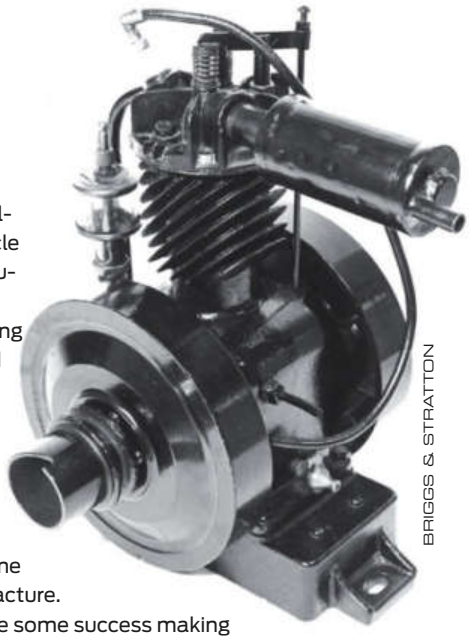
Joel and his wife incorporated Lutron in 1961. The company now holds more than 2,700 patents worldwide and builds more than 15,000 different products, many in the United States.

Briggs & Stratton

Started with a school project

Stephen Foster Briggs developed a six-cylinder, two-cycle engine as an engineering student at South Dakota State College. He was eager to bring his engine to market but did not have the resources. Briggs's basketball coach introduced him to Harold Stratton, a successful grain merchant, and a partnership was formed. Unfortunately, Briggs's engine proved too costly to manufacture.

Briggs & Stratton did have some success making parts for the fledgling auto industry, and even produced a small car named the Briggs & Stratton Flyer, which sold for less than $150. Eventually the company focused on small gasoline engines that powered lawn mowers, outdoor power equipment and even some early washing machines. Briggs & Stratton is currently the world's largest manufacturer of air-cooled engines, building more than 9 million engines in the United States each year.



BRIGGS & STRATTON

Briggs & Stratton 1920s Model F with overhead valves.

Klein Tools

Began with half a pair of pliers

In 1857, a telegraph lineman entered Mathias Klein's shop in downtown Chicago with one-half of a side-cutting pliers and asked Mr. Klein to forge him a new half. That half was so good that the lineman returned looking for a replacement for the other half, and the first Klein lineman's pliers was born.

The Klein Company profited from being one of the few forges to survive the Great Chicago Fire. The company also grew along with the electrical and telecommunication industries, adding more than 100 varieties of pliers. But the original lineman's pliers was so popular that generations of electricians called their pliers simply "Kleins." Klein Tools Inc. is going strong, still owned and managed by members of the Klein family.

The oldest existing Klein lineman's pliers made in 1904 originally sold for $3.60.

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BOBCAT

Eddie Velo on an early version of the Bobcat loader.

Bobcat skid steer loaders

Born in a turkey barn

Eddie Velo had a problem with turkeys, or rather with the mess they made in his barns. In 1956, Eddie asked Louis and Cyril Keller to build him a loader to help clean out his barns. The mechanical loaders available at the time were too big and unwieldy, so the Kellers built a compact three-wheeled loader and tested it out in Eddie's barns.

In 1960, the more familiar four-wheeled M400 was introduced, and skid loaders quickly went from poultry barns to practically everywhere. They're called skid steers because the wheels don't turn to steer. Instead, the wheels on each side rotate at different speeds, which causes a skid.

GRACO

A chilly inspiration

Russell Gray figured there had to be a better way to lubricate a car on a cold Minnesota winter day. The freezing temperatures made hand-operated grease guns nearly impossible to use. So in 1926 he designed a grease gun powered by air pressure and sold it to service stations and others in the automotive industry. Gray Company Inc. quickly became a leader in the industrial fluid-handling business.

The company produced its first paint pump in 1948 and developed the airless sprayer in 1957. This tool revolutionized exterior painting and made Graco a name familiar to every pro painter and many a DIYer. Today Graco makes equipment for a wide range of industries. Its products pump fluids into cars, apply foam insulation to walls and dispense composite resins into molds—they even pump tomato sauce onto pizzas.

Early version of the Graco airless paint sprayer.

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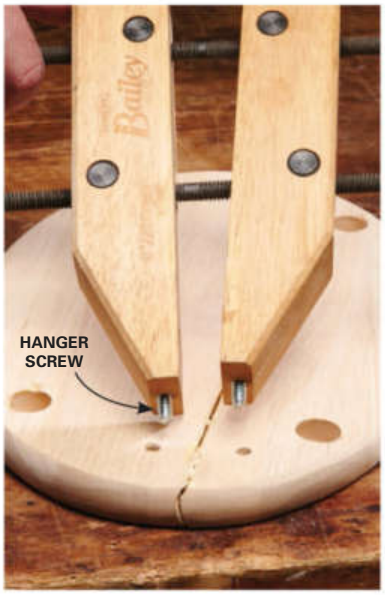
CLASSIC TOOL TIPS

from *The Family Handyman* editors
editors@thefamilyhandyman.com

Ask a *TFH* editor when his wedding anniversary is, or even what day of the week it is, and you might get a baffled look. But ask him about hand screw clamps or the best way to use a router, and he'll talk until you're sorry you asked.

After decades of collecting tool tips, our brains are so full that there isn't room for much else. For this article, we sifted through those thousands of tips and selected a few that have been most useful on our own projects. Tuck them away in your memory and they'll come in handy for you, too (but try not to forget your anniversary).



HAND SCREWS TO THE RESCUE

When I started woodworking, I thought hand screw clamps were old-fashioned school-shop tools, not something any modern woodworker would use. Boy, was I wrong. Sure, fast-action metal clamps are better for most jobs, but for anything out of the ordinary, reach for a couple of hand screws. Why? First, the jaws can clamp tapered parts or parts that aren't parallel. And second, because they're made from wood, you can cut them, drill them and screw stuff to them.

Here's just one example: The oval stool seat above would be tough to clamp with standard clamps. But with hanger screws driven into a hand screw clamp, it's easy. Drill a couple of holes into the seat, insert the hanger screws and squeeze the split seat together.

Ken Collier, Editor in Chief

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THE FAMILY HANDYMAN DIY University

UPRIGHT FOR EDGE WORK

A woodworker's vise is the best way to hold boards on edge. But a pair of hand screws works almost as well. Depending on how you set it up, you may want to insert strips of cardboard under the board to protect it from the hand screws' sharp threads.

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WATCH DEMO

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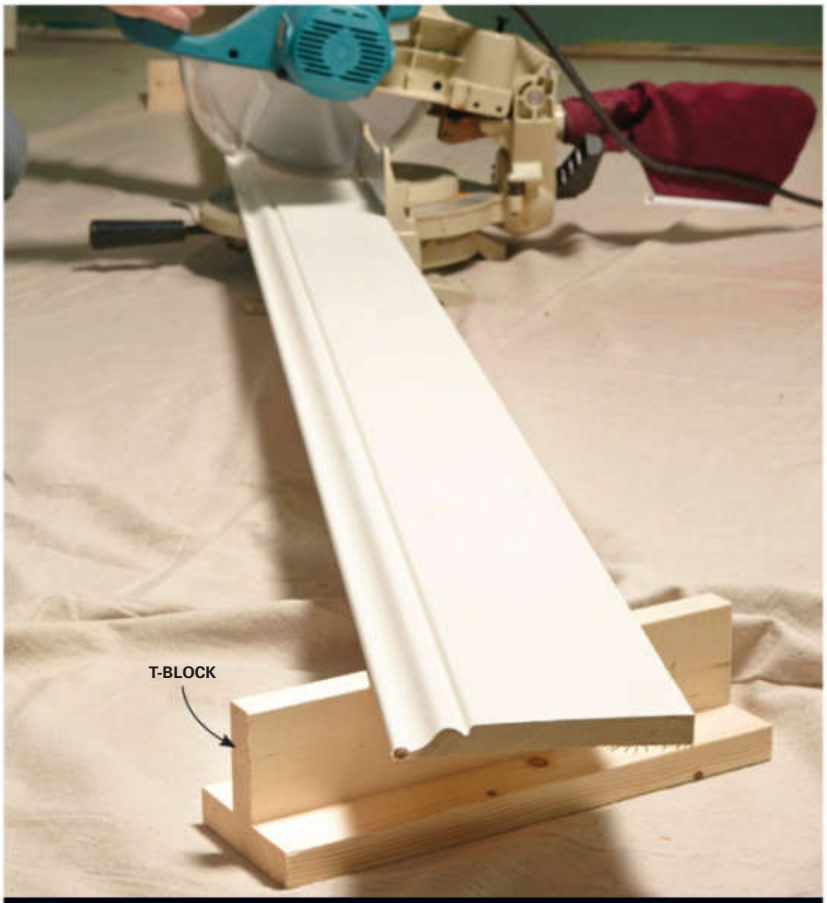
Drill Doctor

Straight-up drill guide

To bore a perfectly perpendicular hole, you need either a drill press or a couple of scraps of wood screwed together. The corner created by the scraps will steer the bit straight in every time. But if you're looking for an excuse to buy a drill press, forget you ever saw this tip.



INSTANT SAW SUPPORT

Simple T-blocks have endless uses. They support long boards, raise projects off your workbench so you can work more comfortably, prop up assemblies so you can slip clamps under them, make a drying rack for finishing projects—the list goes on and on. Build a few from scrap wood and you'll find uses we haven't even thought of.

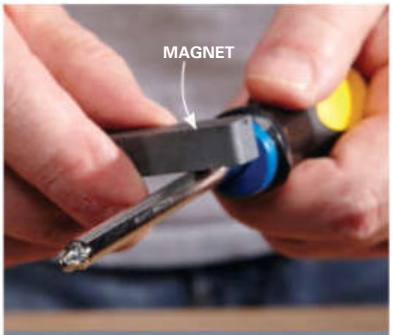
PERFECT WORKTABLE

An old hollow-core door isn't trash; it's the perfect portable worktable. Set it on a couple of sawhorses and you've got a surface that's flat and strong but lightweight and easy to store.

Hank Huff, Field Editor

Recharge station

Cordless tools are the greatest advance in human history. Well, at least for us. But they've also brought charger chaos. We recommend herding all your chargers into one place and plugging them into a power strip. You'll get organization, surge protection and an instant way to switch them all off after the batteries are charged.



Magnetize a screwdriver

This old trick could save you hundreds of dropped screws over your DIY lifetime. Grab a magnet and rub it along the shaft of a screwdriver a dozen times or so. Rub in one direction only, kind of like sharpening a knife. In about 10 seconds, you'll have a magnetic screwdriver. Repeat as needed.

Yikes!

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BELT-SANDER STOP BLOCK

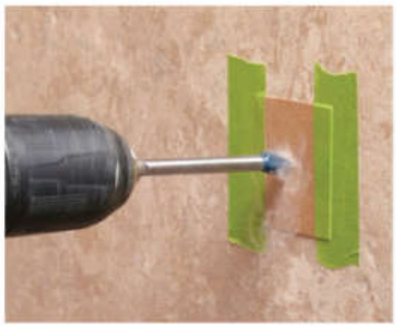
A belt sander is a great tool for sending boards flying across your shop. If you don't want that to happen, clamp a stop block to your workbench. A block of the same thickness as your board will also prevent the sander from tipping down and tapering the end of your workpiece.

Clamp a nail

When there's no room for a hammer, sink the nail with a C-clamp. This trick works for plumbing and electrical straps, junction boxes, and even joist hangers.

Stop a wandering bit

Even the sharpest bit tends to skate across hard materials like tile, metal or glass, leaving loopy scratches behind. To steady a wandering bit, give it a softer place to start. Thin cardboard (the stuff cereal boxes are made from), taped firmly in place, works perfectly.



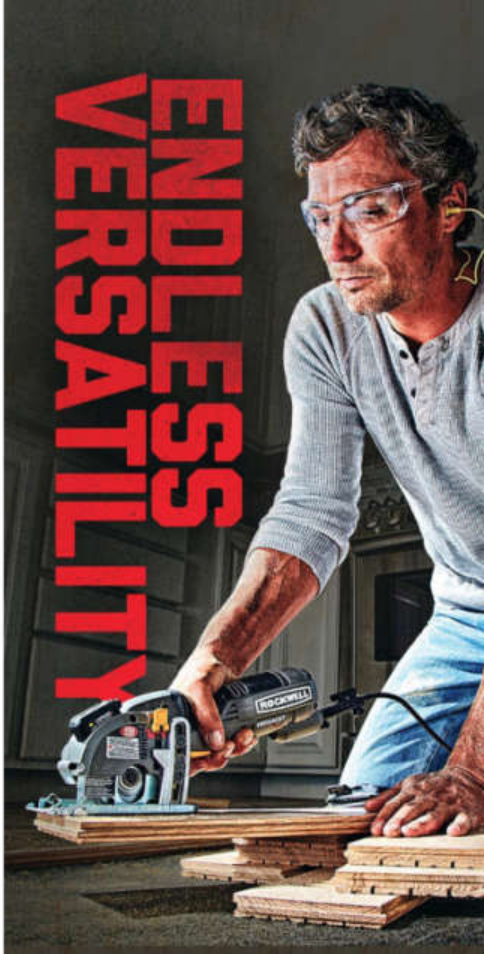
Extract a stuck plug

Struggling to pry the plug out of a hole saw might make you mutter, "Aw, screw it." And that is indeed the correct approach. Drive a long screw into the plug. When the screw hits the back of the hole saw, keep driving and the screw will magically pull out the plug. If the plug is really stubborn, you might have to add a second screw on the other side of the drill bit. Then alternate between the screws, turning one and then the other until the plug is out.

IS YOUR LEVEL A LIAR?

Once upon a time, a man built a house using a lying level, so his floors were not level and his walls were not plumb. And all of the interior work, from installing cabinets to hanging doors, was a real nightmare.* If you want to live happily ever after, give your level a 60-second checkup. Set it on your workbench and slip a shim under the low end until the bubble is centered. Then flip the level around, positioning the other end on exactly the same point on the shim. If the bubble isn't centered, the level is a horizontal liar. To check vertical accuracy, follow the same steps against a wall.

*Yep, this is a true tale.



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FINAL PAINT-PREP STEP

Prep is the key to a fine paint job, as I learned from a 35-year veteran painter. Here's how he taught me to do it: First, patch the walls, then sand down all the walls with 100-grit paper. (He used a drywall pole sander.) That leaves a bunch of dust and debris on the wall, so the next step is to vacuum with a wide floor brush. It's faster and more thorough than a damp rag, and it gets rid of any cobwebs at the same time. You'll still need a rag or small vacuum brush to reach into corners, but then it's on to taping off the woodwork.

Travis Larson, Senior Editor

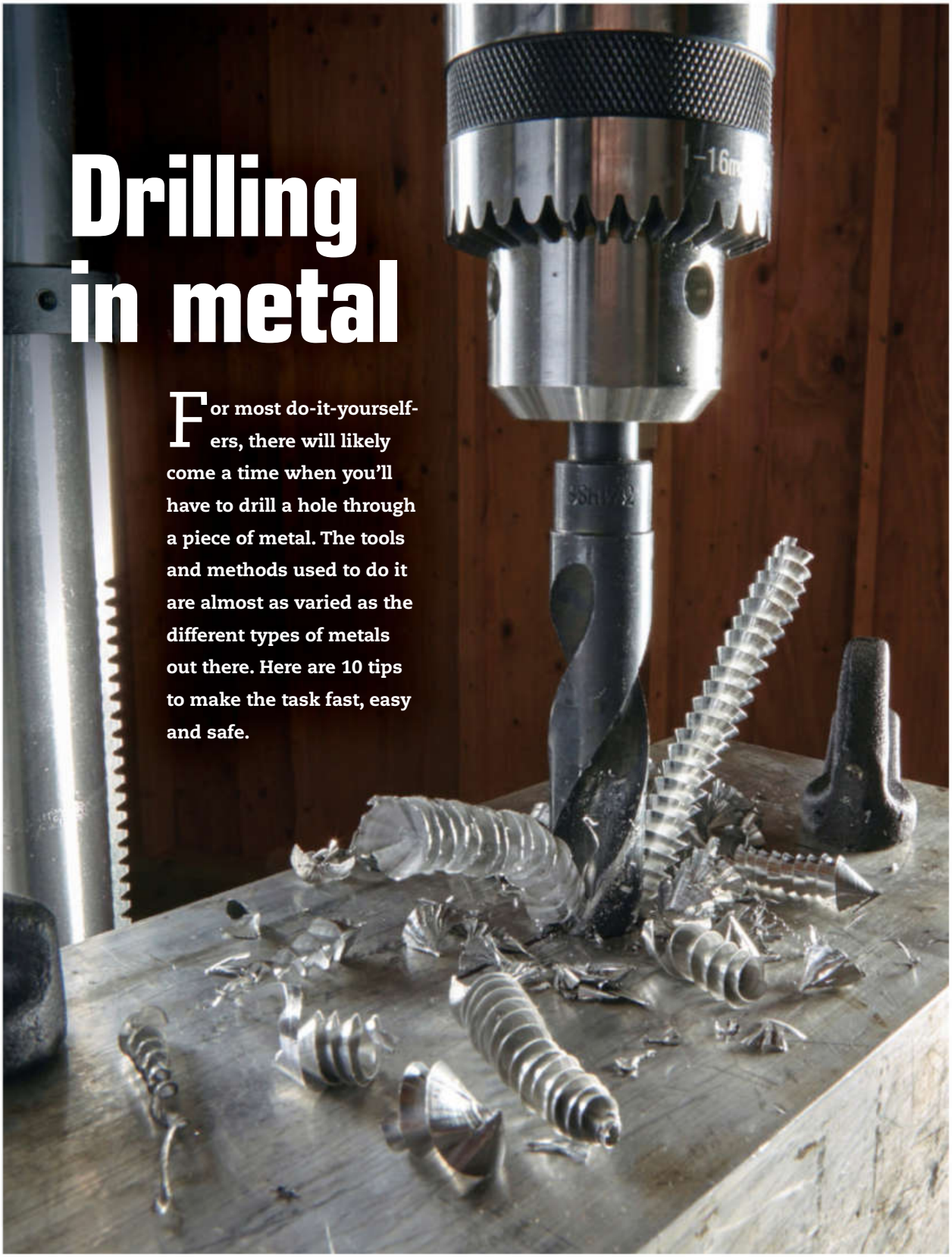
Belt sanders aren't just for wood

Any shop teacher will tell you: Use a tool only for its intended purpose. But I confess—I often use a belt sander for jobs other than sanding wood. It works great to scour dried gunk off putty knives and trowels, and I use it to sharpen chisels, scrapers and shovels too. In fact, I'm a double offender: I use my chisel for all kinds of rough jobs that it wasn't intended for, then I sharpen it with a belt sander. My belt sander actually gives my chisel a better edge than a grinder does.

Jeff Gorton, Associate Editor

Top Ten TIPS

BY JASON WHITE editors@thefamilyhandyman.com



Drilling in metal

For most do-it-yourselfers, there will likely come a time when you'll have to drill a hole through a piece of metal. The tools and methods used to do it are almost as varied as the different types of metals out there. Here are 10 tips to make the task fast, easy and safe.

ART DIRECTION **VERN JOHNSON** • PHOTOGRAPHY **TOM FENENGA**

1 No fancy bits required

Almost any general-purpose twist bit will do a decent job of drilling holes in metal. In fact, most are manufactured to drill through a variety of materials, including wood and plastic. The least expensive twist bits are made of high-speed steel (HSS), and these basic bits are just fine for most metal-drilling tasks.

If you'll be drilling a lot of holes, or need to drill through hard, abrasive metals like stainless steel or cast iron, spend a couple bucks more for black oxide or cobalt steel bits. These bits will bore more holes before becoming dull. Some bits also have a special coating called titanium nitride (TiN), which manufacturers claim helps resist heat and friction better, making them last up to six times longer than standard high-speed steel.

3 Make a dimple

Drill bits have a tendency to wander when you first start drilling. To prevent this, measure and mark where you want the hole and then use a center punch and hammer to create a small dimple. This gives the tip of your drill bit a place to ride in as you begin to drill.

PROTECT YOUR EYES

It only takes one tiny metal fragment to cause a serious eye injury, so proper eye protection when drilling metal is an absolute must. For the best protection, choose safety glasses that wrap around the sides of your face.

2 Lubricated bits last longer

For drilling holes in steel that's 1/8 in. or thicker, use cutting fluid or a multipurpose oil like 3-IN-ONE. Lubricating the bit reduces friction and heat buildup, which makes drilling easier and your bits last longer. For easier-to-drill metals like aluminum, brass or cast iron, lubrication isn't usually necessary.

4 Clamps prevent stitches

Never hold a piece of metal in one hand while trying to drill through it with the other. The bit could catch, instantly causing the workpiece to spin, strike and slash (sharp metal edges slice to the bone!). Always use a minimum of two clamps to securely hold down your workpiece.

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5 Start with a small hole

Need a big hole? Start small! Most twist bits are available in sizes up to 1 in. in diameter, but you'll get the best results by starting with a 1/4-in. hole and drilling successively larger holes until you reach the size you want.

6 Deburr the hole

After drilling a hole in metal, it's a good idea to remove any sharp edges or burrs left behind. You can buy fancy deburring tools to smooth sharp edges, but before spending money on one, try this trick: Take a twist bit slightly larger in diameter than the hole you just drilled, and gently hand-twist it over the top of the hole. This will smooth out the edge of the hole and grind away any burrs.

7 Hole saws cut bigger holes

For large holes, a hole saw gets the job done cleanly and quickly. Like twist bits, hole saws chuck right into your drill and will cut through thin-gauge sheet metals like aluminum and steel. Use a scrap of plywood as a backer for the hole saw's pilot bit and to protect your work surface.

8 Drill at a slow speed

The faster a bit spins, the hotter it gets. And heat dulls bits quickly. In general, it's a good idea to drill through metal using as slow a speed as possible. Hard metals like steel and larger drill bits require even slower speeds. With a small twist bit (1/16 in. to 3/16 in.), you can drill through most metals at 3,000 rpm. For larger twist bits (11/16 in. to 1 in.), 350 to 1,000 rpm is recommended.

9 Make a sandwich

For clean, precise holes in thin sheet metal, make a wood sandwich. Simply sandwich the sheet metal between two pieces of wood and clamp everything down on a table or workbench. The wooden "bread" layers of the sandwich keep the sheet metal flat and prevent the drill bit from wandering as it bores through the sheet metal.

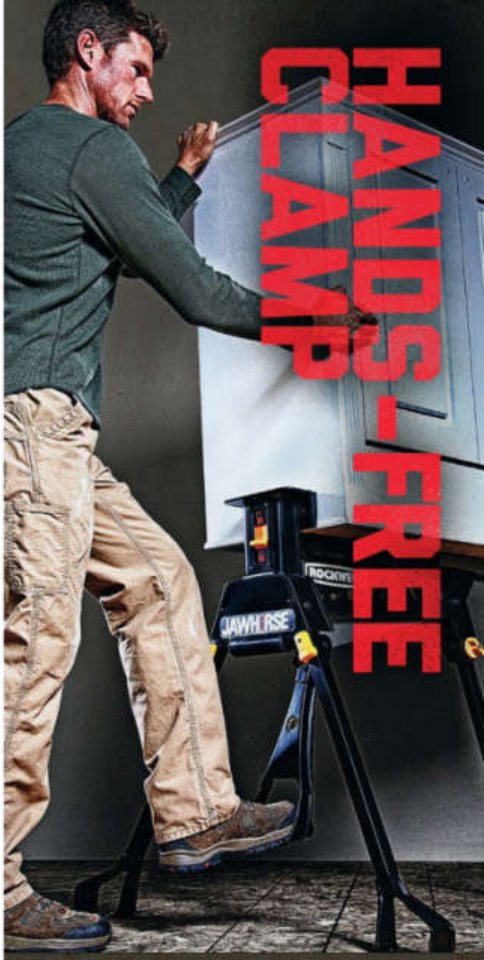
10 Try a step bit

Step drill bits are designed to drill holes in sheet metal and other thin materials. They're just the thing when you need a perfectly sized, clean hole in a steel junction box, electrical service panel or even a stainless steel sink. A step bit allows you to drill holes in a variety of diameters, and some will drill through metal up to 3/8 in. thick. The downside is cost: Expect to spend $20 to $60, depending on size.

STEP UP TO A DRILL PRESS

While it's fairly easy to drill most holes in metal using nothing more than a handheld drill, you'll almost always get greater accuracy and better results using a drill press. Most drill presses are actually built with metalworking in mind. Pulling down on the handle causes the bit to plunge straight down into a workpiece and make a very precise hole.

Drill presses also come with beefy cast-iron tables with tilt and height adjustments, and allow a variety of clamping options. Speed changes are as easy as opening the lid and moving a rubber belt from one pulley to another. The most expensive drill presses are floor-standing models, but you can buy a decent benchtop unit for about $100.



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BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Replace a noisy gas fireplace blower

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENGA • CONSULTANT ANDREW TJERNLUND, FIREPLACEBLOWERHQ.COM

Many gas fireplaces use a blower to drive warm air out into the room. They also have a fan speed adjustment switch so you can strike a balance between blower speed and noise level. But if the fan gets loaded with dust or the motor bearings wear, the blower will make a rumbling noise at all speeds. Sometimes it's possible to remove the blower and clean the fan blades to quiet it (see "Cleaning a Blower," p. 76). But if the blower still makes noise, it's time to replace it.

A professional fireplace service company charges about $400 to do the job (parts and labor). But you can replace the blower with a complete motor/fan blower assembly yourself in about an hour for less than $140. We'll show you how, with the help of an expert from fireplaceblowerhq.com, which manufactures replacement blower assemblies to fit most popular gas fireplaces.

Identify the blower

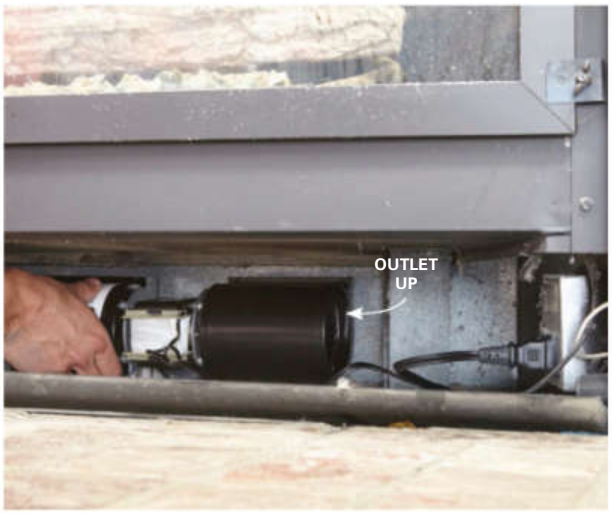
Tilt out the bottom grille and shine a light inside the unit. Then snap a digital photo of the blower assembly. Locate the nameplate on the bottom of the air intake and write down the brand and model number of your fireplace.

Then order a replacement blower from an authorized dealer or an online supplier (fireplaceblowerhq.com is one source). If your blower runs but is noisy, buy just the motor/fan assembly. However, if the motor doesn't run at all, chances are it has a bad temp sensor or speed switch. In that case, buy a complete kit. We

1 REMOVE THE FRONT PANEL
Lift the front panel straight up to unhook it from the side pins. Then pull it straight out and set it aside.

2 SUCK OUT THE DUST BUNNIES
Use a shop vacuum to clean the area in front of the old blower. You'll have to vacuum again once the blower is out, but at least you'll keep most of the dust out of the room.

3 SLIDE OUT THE OLD BLOWER
Pull the blower toward the front of the fireplace. Then rotate it so it clears the grille opening. If you need more clearance, remove the rubber feet.



4 POSITION THE NEW BLOWER
Roll the blower through the grille area and position it with the blower outlet pointing up. Push it all the way to the back of the fireplace until it contacts the back wall. Then pull it forward 1/4 in. to prevent vibration noise.

bought just the blower ($80) for the 14-year-old Heat & Glo gas fireplace shown here.

Remove the old blower

Shut off the circuit breaker and use a voltage sniffer to confirm the power is off. Don't just use the wall switch. Then open the bottom grille. If it doesn't look like you'll have enough room to remove the blower, try removing the front panel (**Photo 1**). Next, clean the area in front of the blower with a shop vacuum (**Photo 2**).

If you've ordered a complete kit, unplug the old blower and disconnect the temperature sensor mounted on the bottom of the firebox. The sensor is held in place with a magnet, clip or screw. Then disconnect the speed control switch and remove the old blower (**Photo 3**). Clean the air intake area again. Then install the new blower (**Photo 4**). Reinstall the kit's new temperature sensor and speed switch and plug in the blower.

Test and adjust

Turn on the power and fire up the burners. Wait for the firebox to heat up enough for the blower to turn on (about 10 minutes). Then adjust the fan speed to your liking and reinstall the front panel (if equipped) and grille.

MEET THE EXPERT

Andrew Tjernlund's family business, Tjernlund Products, has been manufacturing heating and air-handling systems for the last 75 years. Andrew is in charge of the company's blower assembly division, fireplaceblowerhq.com.

CLEANING A BLOWER

Dust bunnies can accumulate on the blades of a fireplace fan and throw it out of balance. That causes vibration, noise and premature bearing wear. Cleaning a fireplace blower every few years keeps it running quieter and longer.

Remove the blower and suck out as much dust as possible with a shop vacuum. Gently brush across the fan blades with an old toothbrush, taking care not to bend the blades. Then vacuum a second time. Reposition the blower and test it for noise and smooth operation. If it runs without vibration, it's good for another heating season.

Adjust a can light to fit a CFL or LED bulb

CFL and LED reflector bulbs aren't always the same height as older incandescent-style bulbs. So they might sit above or below the trim ring in a ceiling can light. Don't worry; you can easily adjust the socket height to accommodate the new bulb. Just turn off the power, remove the old bulb and move the socket plate as shown.

ADJUST THE SOCKET HEIGHT
Loosen the wing nut and slide the socket plate up or down to accommodate a different bulb height. Then gently snug up the wing nut and test-fit the bulb. Make final adjustments and then fully tighten the nut.

Repair a broken drawer front

High-quality cabinet drawers are built with a sturdy box and a separate decorative drawer front. But the drawer fronts on economy cabinets are part of the box itself. They're attached to the sides and bottom with a mortise-and-tenon joint and held with glue and staples. Repeated openings and closings break the joint and the drawer front falls off. You can try regluing the joint, but it won't last. Here's how to fix the problem permanently.

Cut a 3/4-in.-thick piece of wood to match the width and height of the drawer box. Then remove the staples from the tenons and clean up the rough edges so you can reinstall the drawer front (**Photo 1**). Glue the new wood block directly behind the drawer front (use polyurethane glue if the box sides and bottom have been varnished). Secure with nails or screws. Then attach the old drawer front to the new wood block (**Photo 2**).

Using the old drawer pull holes as a guide, drill through the new wood block. Buy longer No. 8-32 x 1-3/4-in. machine screws and remount the drawer pull.

1 REINSTALL THE DRAWER FRONT
Remove the drawer pull and screws. Then line up the mortise-and-tenons and the drawer bottom with the groove and tap the drawer front back onto the box.

2 REINFORCE THE DRAWER FRONT
Drill four 1/8-in. pilot holes through the newly installed box front. Then drive coarse-thread drywall screws through the new box front and into the old drawer front.

COMPACT CIRCULAR SAW

Big, bulky circular saws have met their match. The Rockwell Compact Circular Saw weighs in at a mere 5 pounds without sacrificing an ounce of cutting capacity. The comfortable inline grip lets you make all the big cuts. And it maneuvers easily.

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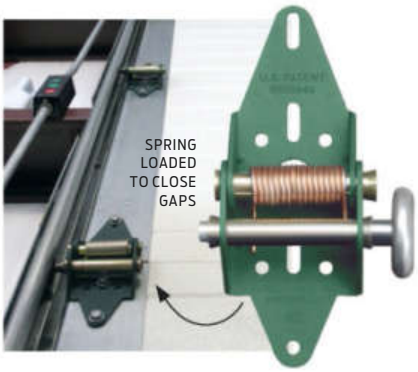

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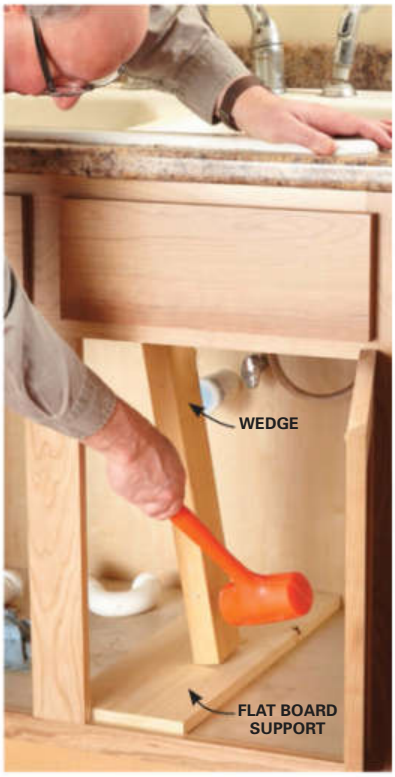
Remove a self-rimming cast iron sink

Self-rimming cast iron sinks are held in place with caulk. If you're replacing the sink but keeping the laminate countertop, you'll have to cut through the caulk. That can be tricky, especially if the caulk has hardened.

You'll need lots of patience and these items: shims, a few feet of 2x4, a stiff putty knife and a heavy-duty solid-blade utility knife (one choice is the Olfa L-2 knife, $11, with L-SOL-10B blade, $9; both from olfa.com).

Wedge a 2x4 between the sink bottom and the floor of the cabinet to create slight upward force (**Photo 1**). Then cut the caulk (**Photo 2**). If the caulk is too hard to cut, hammer an old putty knife through the caulk, driving it toward the sink a section at a time.

Once you've cut the back corners, sides and front, tilt the sink up and cut the remaining caulk from the underside of the sink. Lift out the sink and clean the caulk residue from the laminate.



1 WEDGE THE SINK
Lay a flat board across the cabinet bottom. Then angle a 2x4 between the sink basins and the board. Tap it so it pushes up against the sink bottom.

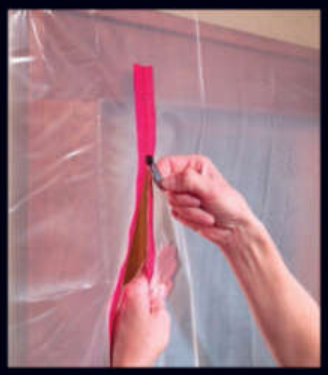
2 CUT AND SHIM
Slice through the caulk with a utility knife if possible. If the caulk is too hard to cut, use a putty knife like a chisel to cut through the caulk. To lift the sink, tap in shims as you go. Then cut along the front edge of the sink and up the opposite side.

BY MARK PETERSEN editors@thefamilyhandyman.com

Dust-free remodeling

Dealing with the dust created by a remodeling job can be inconvenient, time consuming and, sometimes, an unhealthy chore. We consulted our friends in the trades and came up with some great tips, cool tools and handy products to help minimize the mess.

ART DIRECTION **MARCIA ROEPKE** • PHOTOGRAPHY **HSP**



Seal off the room

It's important to prevent dust from traveling from where the work is being done to other rooms in the house. A loose curtain of plastic hung over a doorway with a few strips of tape won't do the job. Instead, completely seal the top and sides with tape and lay a board over the plastic at the bottom. Use heavier 4- or 6-mil plastic and add an adhesive-backed zipper for easy entry. The zippers are available at home centers and lumberyards for less than $10.

Low-dust joint compound

Drywall sanding may be the single dustiest process in any remodeling project. While there's no way to control all the dust, working with a low-dust joint compound will help. Low-dust mud is formulated to fall straight down to the ground instead of floating around. The downside is that low-dust mud is harder to sand than regular mud and can cost 60 percent more, so most pros use it only on smaller remodeling projects and put up with the mess on larger jobs.

Clean the air

You can't help but create dust at a job site, but you don't have to breathe it in. Shop-Vac makes a portable air cleaner to help clear the air you breathe. It filters out particles down to 5 microns and recirculates the air in a 290-sq.-ft. room every 10 minutes. It weighs 15 lbs. and is about as loud as a box fan. This system won't replace your respirator, but at $130, it's a smart, economical buy to reduce your risk of chronic respiratory problems. Heck, one trip to the doctor for a sinus infection will cost you more. Buy one at an online retailer.

CONQUER DRILL DUST

Here's a neat little tool that sucks up the dust right at the source. Hook the BitBuddie up to a vacuum and place it over the spot where you plan to drill. This thing lets no dust escape whatsoever, and the suction from the vac actually holds it to the wall! It will also suck up slurry if you're wet-drilling. The BitBuddie is made by Dustless Technologies and comes with an 18-in. hose. Buy one online for $42.

CREATE AN ISOLATION CHAMBER

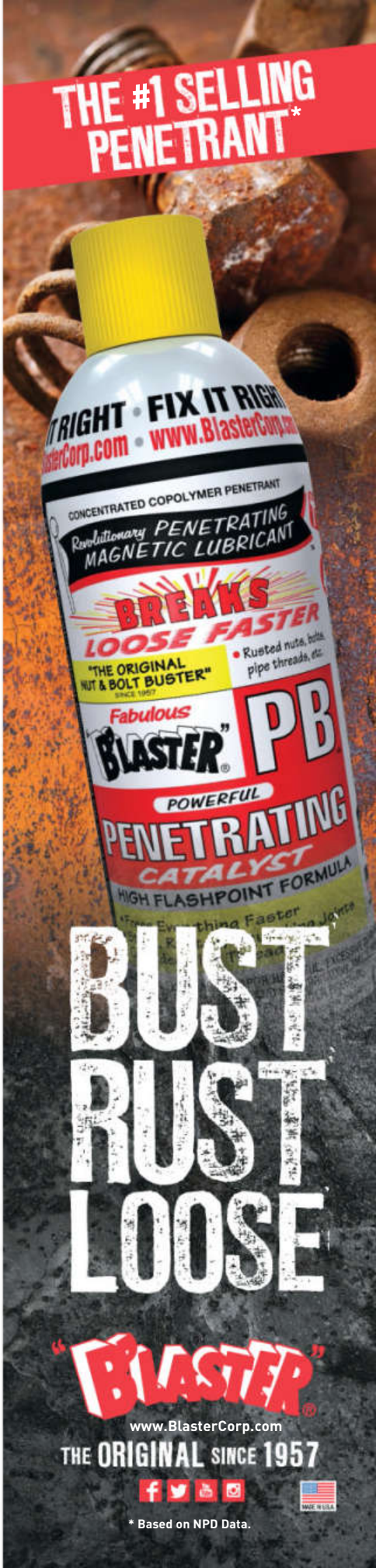
There's no way to eliminate all the dust from a remodeling job, so your best bet is to contain it. Create a room within a room using the ZipWall spring-loaded pole system. The pads on the end of the poles lock onto sheets of plastic, creating temporary walls that only take a few minutes to set up. For about $195, you'll get a set of four poles that adjust from 4 ft. 2 in. to 10 ft. 3 in., two zippers and a carrying bag. You can find the ZipWall system at home centers and lumberyards.

Nibble away at fiber cement

The dust created from cutting fiber cement siding with a circular saw is not only prodigious; it's also hazardous to your health. If you have a thousand cuts to make, a circ saw is a necessary evil, but if you're just making repairs or installing siding on a small addition, consider cutting with the TSF1 TurboShear made by Malco. This shear attaches to most drills larger than 14.4 volts and creates very little dust as it chews its way through fiber cement siding. It also can cut curves! Buy the TSF1 TurboShear online or at specialty tool stores for $110.

Don't forget sweeping compound

Sweeping compound has been around forever, and that's because it works! The product here is not the same spill-absorbent stuff your janitor used to clean up after your upset stomach incident in the third grade. This sweeping compound is designed for one purpose only, to prevent clouds of dust when you're pushing a broom. We use it in our own shop to protect our expensive camera equipment. A 50-lb. bag costs $25 at home centers.



Wear a respirator, not a dust mask

Dust masks and respirators may look the same, but respirators are designed to block 95 percent of small particles (0.3 micron). To find a true respirator, look for "N95" on the label. In order for a respirator to work, it needs to fit properly. There are respirators available in small, medium and large—wear one that fits. And for you blokes with bushy beards, respirators are better than nothing, but they won't provide the protection you need. If you work around dust a lot, you should ditch the whiskers.

Save trips to the vac

Using a vac as a dust collection system makes a lot of sense, but walking back and forth to turn it on or off can get a bit tedious, and listening to it run all day is not an option. Do yourself a favor and pick up an i-Socket Autoswitch. Plug the Autoswitch into the wall, and then plug the tool and the vac into the Autoswitch. Every time you fire up the tool, the Autoswitch will trigger the vac. Once you've made your cut, the vac continues to run for seven seconds so it can finish sucking up the dust. i-Sockets are available for $40 at hardware stores and online.

Make your wet/dry vacuum filter last forever

Fine drywall and masonry dust will plug a vac filter almost immediately. The Dust Deputy from Oneida separates large and small particles into a 5-gallon bucket before they can reach your vac, so you don't have to waste time cleaning the filter every three minutes.

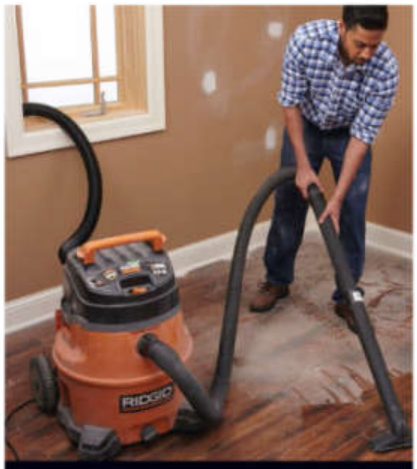
This model comes with two buckets, all the hoses you need and casters for the bucket. The bucket can be permanently fastened to the vac, but the pros we talked to prefer to strap it on with a bungee so it can be easily separated for dumping. A 5-gallon bucket is a lot easier to carry outside to dump than a cumbersome vac canister. The Dust Deputy Deluxe shown here costs $99. Go to oneida-air.com to find out where to buy it.

Keep the ducts clean

Always shut down the furnace during the dusty periods of any remodeling job, and cover the return air vents with plastic until the job is complete.

Dust-sucking rotary tool

Nothing works better at cutting holes in drywall than a rotary tool. It's also true that nothing fills a room with dust faster. Thankfully, RotoZip has figured out how to control that dust. Its new RotoSaw with Dust Vault has an integrated dust collection system that reduces airborne dust by up to 90 percent. It also works on wood, cement board and tile, among other materials. Pick one up at a home center for $99, or buy the attachment for $30 if you already have a rotary tool.



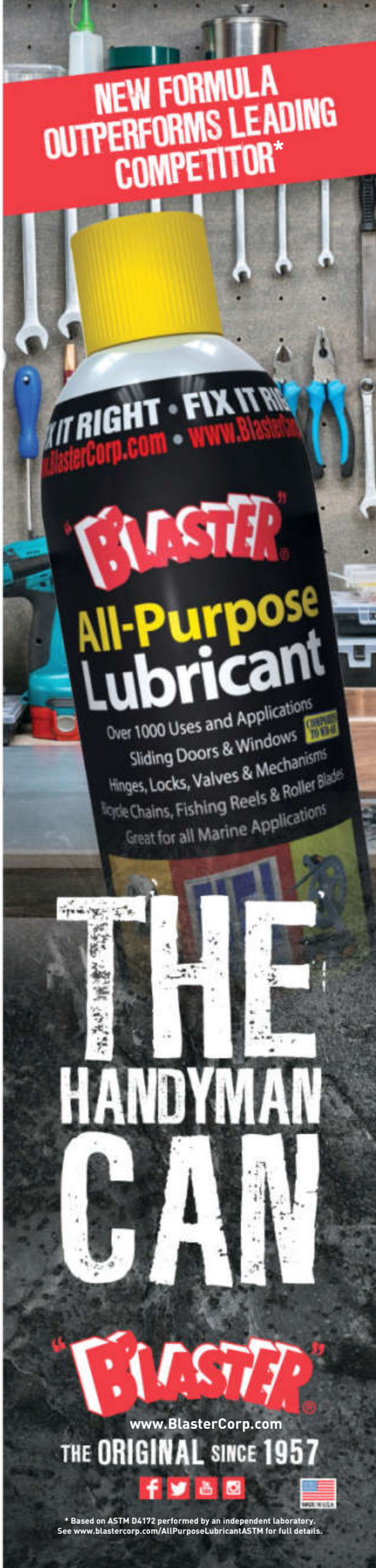
EXHAUST THE VAC OUTSIDE

Want a sure way to kick up a bunch of dust on a remodel site? Switch on a vacuum. The exhaust air is guaranteed to blast filth all over the place. Prevent this ironic tragedy by pumping that dusty air outside with an additional hose hooked up to the exhaust port.

Knock down dust with water

When cutting stone or masonry, have a helper wet down the blade of the circ saw. This will prevent the dust from getting airborne, and the slurry will extend the life of the blade by keeping it cool. A garden sprayer works perfectly for this job.

Caution: Plug the saw into a GFCI-protected outlet or into a special portable GFCI plug.



PRO talk

BY MARK PETERSEN editors@thefamilyhandyman.com

TIP FROM A FELLOW PRO

Isolate the repair

When I'm making supply line repairs in an accessible area, I like to install a shutoff valve right away so the water in the rest of the house can be turned back on while I'm working. Plus, many shutoff valves can be used as transitional fittings when you're joining dissimilar pipes. That's what I call killing two birds.

Les Zell, Zell Plumbing

PRO GOOF

BINGO!

I was helping the HVAC guys lug a new air handler through the attic at a retirement home. From the auditorium far below us, we could hear the big, noisy crowd enjoying bingo day. Just as a player shouted "BINGO!," my foot slipped off a joist and punched through the ceiling. Chunks of gypsum rained down, and the cheers turned to screams.

The auditorium was quickly evacuated, except for the unhappy superintendent and retirement home director, who were waiting for me when I climbed back down from the attic. Luckily, there were no injuries, or lawsuits, but I did have to spend the evening on an 18-ft. ladder patching the hole.

Gary Wentz, Senior Editor

Got something for us?

If you've got a tip, a brag photo or a project you'd like to share with fellow pros, send it to us at editors@thefamilyhandyman.com. We pay $100 for each one we publish.

PROJECT I'M PROUD OF

Complicated kitchen cabinets

I recently completed a kitchen remodel for a customer who wanted vintage cabinets. I explained that new cabinets would probably cost less, but she didn't want it any other way. Who was I to argue with my boss?

She found the style she was looking for at a salvage shop and bought lots of extras, knowing that some cabinets would need to be cannibalized to make the others work. In addition to combining old parts, I had to build several new ones, which required careful wood selections and extremely fussy color matching. In the end, my customer was happy and sent me home with a great reference—the best advertising around.

David Radtke, David Radtke Design

RADTKE

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BY RICK MUSCOPLAT editors@thefamilyhandyman.com

Cool mechanic tools

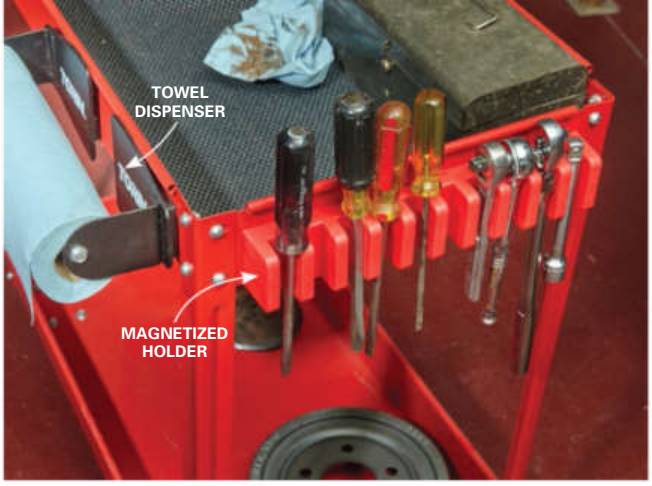
Fixing your own car or truck can save a bundle, and the experience can be rewarding, especially if you have the right tools. We assume you already own the basics, like sockets, ratchets and screwdrivers, so we rounded up an assortment of accessory tools that make auto repair a little easier.

Convertible creeper

Most creepers are hard, flat, unpadded boards with tiny wheels that get stuck in cracks in your garage floor. Not this one! Here's a creeper that's not only comfortable but also convertible. Pull the release pin and lift up on one end and you've got a roll-around seat that's the perfect height for working around wheels.

The padding is extra thick and the wheels are extra-large 3-in. soft polyurethane, so the creeper rolls smoothly, even over debris and cracks. It's a bit higher off the ground than other creepers, so you'll have to raise the vehicle an extra few inches. But it's worth it for the comfort. The heavy-duty frame is rated for up to 450 lbs. for heavy-duty mechanics. The Omega 91000 Z Creeper is $65 at tooldiscounter.com.

ART DIRECTION VERN JOHNSON • PHOTOGRAPHY TOM FENENGA



Keep tools and towels handy

Set this magnetic tool organizer (Torin No. MPH10RT, $22 at Lowe's) onto a rolling cart and keep up to 10 tools at your fingertips. For easy access, mount the shop towel holder (Torin No. MTHT; $17 at Lowe's) on your toolbox, cart or under the hood.

A jumper pack/ charger combo

Recently there have been news stories of defective lithium jumper packs that burst into flames during a jump-start. But this lithium battery jumper pack (CHARGE IT, No. PP15, $118 at amazon.com) includes safety features to keep you off the evening news.

The pack is small and lightweight (3.3 lbs.) and stays charged much longer than a traditional lead acid–type pack. The battery puts out 270 cranking amps—enough to start most four- and six-cylinder engines. And it comes with charging adapters and a USB port to charge your phone or tablet. Buy the optional 19-volt laptop charging kit and use the pack to charge your computer (PPA17; $15 at amazon.com).

Blast off seized bolts

This tool and a can of rust penetrant are the secret to removing stubborn rusty seized bolts. Load the driver tool into your air hammer and slide on a socket and wrench (Lisle No. 60260 kit; $24 at amazon.com). When you hit the trigger, the driver applies the impacts to the center of the bolt head, demolishing the rusty buildup. Turn the wrench and socket during the impacts and you'll loosen the bolt or nut in no time.

Stubby impact wrench

Sometimes you just can't fit an ordinary air impact wrench into tight spaces. That's where this ultra-compact stubby impact wrench comes in handy (Chicago Pneumatic No. CPT7732; $130 at toolsource.com). It's only 4.4 in. long and weighs only 2.86 lbs., yet it puts out 450 ft.-lbs. of torque.

Great multimeter, great price

It's really this simple: If you want to diagnose automotive electrical problems, you need a good multimeter. This unit (ESP No. 585K, $72 at tooldiscounter.com) comes with alligator clips, test leads, a clamp-on rpm pickup and a temperature probe. Set the screen to display in digital readings or as a bar graph. The 45 test ranges and 14 test functions allow you to check DC and AC voltage and amps, dwell, duty cycle (for fuel injectors, digital voltage regulators and cam phasers), frequency (MAP and MAF sensors) and temperature. Get the optional mini probes (ESP No. 618; $7 at tooldiscounter.com) to test components while in use.

Drive adapters for tight spaces

If a normal ratchet and socket won't fit into a tight spot, just slap one of these adapters into a ratcheting wrench. Then load on a socket and get the job done. The three-piece set (Gearwrench 9231D; $21 at jbtoolsales.com) comes with a 1/4-in.-, 3/8-in.- and 1/2-in.-drive adapter.

Light up your project

Although the Bayco Nightstick is called an under-hood light, it's an even better under-*vehicle* light. Just unsnap it from the bracket to use it down under. The strong magnets hold it in place, and the tube rotates 200 degrees, so you can aim the light exactly where you need it. Click the switch to choose either 650 or 1,200 lumens. The 120-LED light (the Bayco Nightstick No. SLR-2120; $130 at northerntool.com) is rechargeable and comes with an under-hood bracket and a charging transformer. The internal battery runs the Nightstick for 4.5 hours at 1,200 lumens, and 8.5 hours at 650 lumens. As a bonus, it's a perfect emergency light for the house during power failures.

Remove the gasket, not the metal

Scraping off an old gasket on an aluminum engine? Not with a metal scraper, you don't! That's a great way to gouge the surface and create a leak. Instead, buy this two-piece scraper kit and a pack of non-marring hard plastic blades. The Titan No. 17002 scraper kit, $12, and Titan No. 12038 (21 non-marring blades), $4, are available at tooloutfitters.net.

Fill hidden reservoirs

What can we say? The Lisle No. 17232 Right Angle Funnel is a funnel built with an offset. It's perfect for refilling brake and power steering reservoirs that are tucked under the cowling. It's available for $8 at sears.com.

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Pliers/ wrench rack

Drop this nifty rack in a deep tool chest drawer and fit more pliers and wrenches in less space by storing them on their side. The Lisle No. 404090 storage rack ($18 at amazon.com) holds up to 13 tools and has two different size slots.

The owner's manual for your house.

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#1 in DIY Home Improvement

Brushless impact wrench

Brushless technology uses almost 50 percent less battery power to do the same work as a conventional motor, so you get much longer run-times from a charge. This brushless Rockwell 1/2-in.-drive impact wrench is light (3.3 lbs.) yet delivers up to 216 ft.-lbs. of torque. Register the tool when you buy it and you'll get free battery replacements for life! It's lightweight and durable. The Rockwell No. RK2855K2 impact wrench with two batteries, charger and carrying bag ($259) is available at home centers and amazon.com.

PASS-THROUGH SOCKET AND RATCHET

ORDINARY SOCKET AND RATCHET

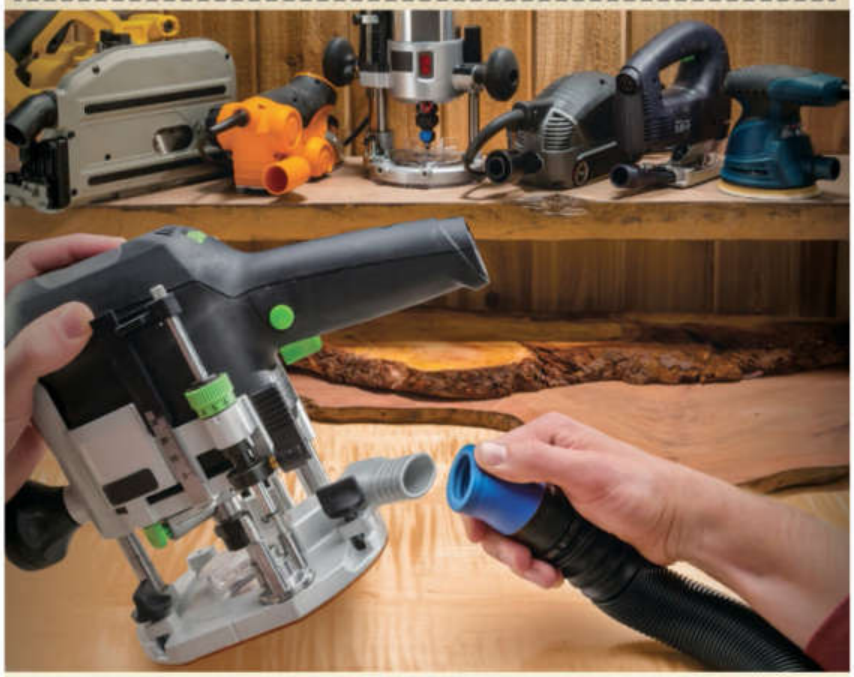
Pass-through sockets get you into tighter spaces

When you have to remove a bolt but don't have enough clearance for an ordinary ratchet and socket, try these pass-through sockets and ratchet from Kobalt. This 10-piece socket set, No. 379764, $13, and 3/8-in.-drive ratchet No. 379802, $20, are from Lowe's.

Break bolts with extra leverage

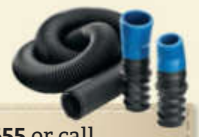
You simply can't reach some bolts in crowded engine compartments. Even when you do, many times you can't get enough leverage. Connect your 1/2-in.-drive ratchet or breaker bar to the square hole in this Lisle No. 43500 1/2-in.-drive wrench. Add a socket and break the bolt loose. If you still can't get enough leverage or don't have the space for a ratchet, connect the Lisle No. 43370 long handle to your air chisel and blast it loose with air power (driving wrench, $19, and long handle, $41; both at toolsource.com).

Flex ability... one hose fits 'em all!



This award-winning flexible hose kit connects to almost any handheld power tool! The stretch hose won't fight you as you move about and expands from 3' to 15'.

Universal Small Port Hose Kit (48212) $39.99



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BUYING tips

BY ELISA BERNICK editors@thefamilyhandyman.com

Vacuum cleaners

A quality vacuum cleaner should be versatile enough to clean a variety of surfaces (carpet, upholstery, wood floors) and durable enough to perform well for many years. But beyond that, with so many different choices and price points, how do you know which one to buy?

Whether canister or upright, bagged or bagless, the best models have features that work together to maximize airflow and agitation. We'll help you narrow your search with great advice from an expert who has 40 years of vacuum savvy.

BAGS VS. BAGLESS

If allergies are a concern, buy a bagged vacuum cleaner or a top-of-the-line bagless. Bagged vacuums require less maintenance and tend to be cleaner to run because the bags themselves act as a very efficient filter (especially high-quality synthetic anti-allergen, or "True HEPA" bags). They are also cleaner to empty because there's no contact with loose dust.

Cheap bagless vacuums leak, clog and require unclogging and maintenance more often. And bagless filters tend to clog quicker, so performance diminishes over time. Although you don't have to buy bags, they still use filters (buy a model with True HEPA filters), which need to be periodically cleaned or replaced. And replacement filters tend to be significantly more expensive than bags.

The best cost $400 to $600

At this price point, the vacuum will have a tightly sealed system outfitted with rubber gaskets to keep dirty air from leaking back into your house. It will also include a long warranty (often five to seven years if you buy it from an authorized dealer). Most will also have features like wheels that pivot 360 degrees, a long cord, washable filters, HEPA filters and cloth bags.

Spending more than $400 to $600 will buy convenience features but won't improve a machine's cleaning ability. If you spend less, you'll probably end up with more repair bills and a shorter life span.

ART DIRECTION **MARY SCHWENDER** • PHOTOGRAPHY **TOM FENENGA**

Upright vs. canister— Which is best?

Choose a vacuum style geared toward your primary cleaning task.

Mostly carpeting?

Choose a bagged, upright model for the best performance on carpet. The best uprights are heavier than canisters (they average about 17 lbs. and canisters about 10 lbs.). Even if you plan to buy an upright online, go to a store first to push, pull and lift it to make sure you can maneuver it comfortably.

Mostly bare floors, drapes and upholstery?

Canister vacuums work well for these items, and they're also easier to handle on stairs. Most canisters are quieter and lighter than uprights because you're mostly moving the hose and power head (a rotating brush), not the entire machine. While canisters tend to be more flexible than an upright, they're bulky, and the hose and wand can make them harder to store.

AVOID FLAT RUBBER DRIVE BELTS

The drive belt connects the brush roller to a spinning motor shaft. A geared belt has interlocking teeth on the roller and motor shaft, and a serpentine belt has grooves in its surface. Unlike flat rubber belts, geared and serpentine belts last five to 10 years and won't lose tension, so the roller is always spinning at maximum rpm.

Look for a chevron roller bristle pattern

The brush roller pulls debris from between the carpet fibers so that it can get sucked up by the suction head. Adjustable rollers can be raised or shut off on bare floors to protect the finish and avoid scattering debris. Check the roller's bristle pattern. A chevron bristle pattern (shown here) pushes debris toward the suction head better than any other roller bristle configuration.

MEET THE EXPERT

Russ Battisto, owner of A-1 Vacuum Cleaner Company in St. Paul, MN, has been in the vacuum business since 1975. He says the toughest part of his business is keeping up with what works and what doesn't, given all the new choices and technological advances in vacuum cleaners.

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★ WINNER ★ – Truckin' Magazine

26", 4 DRAWER TOOL CART

US★GENERAL

LOT 95659 shown 61634/61952

• 580 lb. Capacity

Customer Rating

SAVE $180

$99.99

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Central Machinery

4" x 36" BELT/ 6" DISC SANDER

LOT 62502 97181 shown

SAVE $80

$59.99

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WOW SUPER COUPON

2.5 HP, 21 GALLON,125 PSI VERTICAL AIR COMPRESSOR

LOT 67847 shown 61454/61693/62803

Customer Rating

SAVE $70

CENTRAL PNEUMATIC

$149.99

REG. PRICE $219.99

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WOW SUPER COUPON

12" x 33-3/8" WOOD LATHE WITH REVERSIBLE HEAD

Central Machinery

LOT 34706

Customer Rating

SAVE $120

$229.99 ~~$299.99~~

REG. PRICE $349.99

18610195

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MECHANIC'S GLOVES

MEDIUM LOT 62434 62426

LARGE LOT 62433 62428

X-LARGE LOT 62432 62429 shown

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SUPER COUPON

SAVE 66%

72" x 80" MOVER'S BLANKET

HaulMaster

LOT 66537 shown 69505/62418

$5.99

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26", 16 DRAWER ROLLER CABINET

LOT 61609 67831 shown

SAVE $330

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• 14,600 cu. in. of storage

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For indoor use.

LOT 91470/62952 61558 shown

SAVE $30

NEW

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SUPER COUPON

4 PIECE 1" x 15 FT. RATCHETING TIE DOWNS

LOT 60405/61524/62322/90984 shown

HaulMaster

SAVE 60%

$7.99

REG. PRICE $19.99

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SUPER COUPON

14" OSCILLATING SPINDLE SANDER

Central Machinery

LOT 95088/62146 69257 shown

SAVE $50

$99.99

REG. PRICE $149.99

18694462

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SUPER COUPON

1/4" TRIM ROUTER

drillmaster

LOT 61626 62659 44914 shown

SAVE 63%

$19.99

REG. PRICE $54.99

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SUPER COUPON

1.5 HP ELECTRIC POLE SAW

CHICAGO ELECTRIC OUTDOOR

SAVE $30

LOT 62896 68862 shown

• Extends from 6 ft. to 8 ft. 10"

$69.99

REG. PRICE $99.99

18660124

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SUPER COUPON

NEW

2.5 HP, 10" TILE/ BRICK SAW

CHICAGO ELECTRIC POWER TOOLS

SAVE $170

LOT 62391 69275 shown

$229.99

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SUPER COUPON

350 LB. CAPACITY FOLDING SAW HORSE

Central Machinery

LOT 69446 shown 61979/60710

SAVE 37%

$9.99

REG. PRICE $15.99

18712353

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Customer Rating ★★★★½

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SAVE $165

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LOT 69080 shown
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1883945 7

SUPER COUPON

PREMIUM RETRACTABLE AIR HOSE REEL WITH 3/8" x 25 FT. HOSE

CENTRALPNEUMATIC

LOT 69266/46104
69234 shown

SAVE $50

$49.99

REG. PRICE $99.99

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SUPER COUPON

RAPID PUMP® 3 TON LOW PROFILE HEAVY DUTY STEEL FLOOR JACK

PITTSBURGH

SAVE $85

• Weighs 73 lbs.

20"

LOT 68049/62326
62670/61253/61282 shown

$84.99

REG. PRICE $169.99

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SUPER COUPON

CENTRALPNEUMATIC

Customer Rating ★★★½

3 GALLON, 100 PSI OILLESS PANCAKE AIR COMPRESSOR

LOT 95275 shown
60637/61615

$39.99

REG. PRICE $89.99

SAVE 55%

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WOW SUPER COUPON

18 GAUGE 2-IN-1 NAILER/STAPLER

Customer Rating ★★★★½

CENTRAL PNEUMATIC

SAVE 55%

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68019 shown

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WOW SUPER COUPON

2 HP, 70 GALLON INDUSTRIAL 5 MICRON DUST COLLECTOR

CENTRAL MACHINERY

Customer Rating ★★★★½

LOT 61790
97869 shown

SAVE $80

$169.99

REG. PRICE $249.99

18723349

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SUPER COUPON

11 PIECE WOOD CARVING SET

WINDSOR DESIGN

LOT 62673
60655 shown

SAVE 40%

$5.99

REG. PRICE $9.99

18747799

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SUPER COUPON

TORQUE WRENCHES

PITTSBURGH PRO

• Accuracy within ±4%

YOUR CHOICE!

1/4" DRIVE
LOT 2696/61277

3/8" DRIVE
LOT 807/61276

1/2" DRIVE
LOT 62431
239 shown

$11.99

REG. PRICE $29.99

SAVE 60%

18752508

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What homeowners MUST know

BY GARY WENTZ editors@thefamilyhandyman.com

ART DIRECTION MARY SCHWENDER • PHOTOGRAPHY HSP

MODEL BEFORE YOU REMODEL

A quick, crude model of a kitchen island, cabinetry or even furniture is the best way to determine if it's too big or too small. Leave it in place and live with it for a few days before you decide whether it's a convenience or a curse. OSB makes a great modeling material because it's inexpensive. But for ease of building, you can't beat 1-in.-thick foam insulation. You can carry a 4 x 8-ft. sheet with one hand, cut it with a utility knife and strap parts together with masking tape. You can even mock up walls and doors.

DO ALARM SYSTEMS WORK?

Yes, all the experts agree that most crooks shy away from homes with security systems. But you have to advertise: If thieves don't know you have a system, they won't be deterred. Post the yard sign and window stickers where they can't be overlooked.

Buy a high-quality pad

The right pad will extend the life of your carpet, but the wrong pad can cut the life of your carpet in half. The quality of carpet pad is determined by density, not thickness. A good-quality pad will be 3/8 to 1/2 in. thick and have a density/weight rating of at least 6 lbs. (the residential standard). In most cases, cheap, low-density pad will only last a few years before it needs to be replaced. For high-traffic areas, get a thinner pad with a density of 8 lbs. or more.

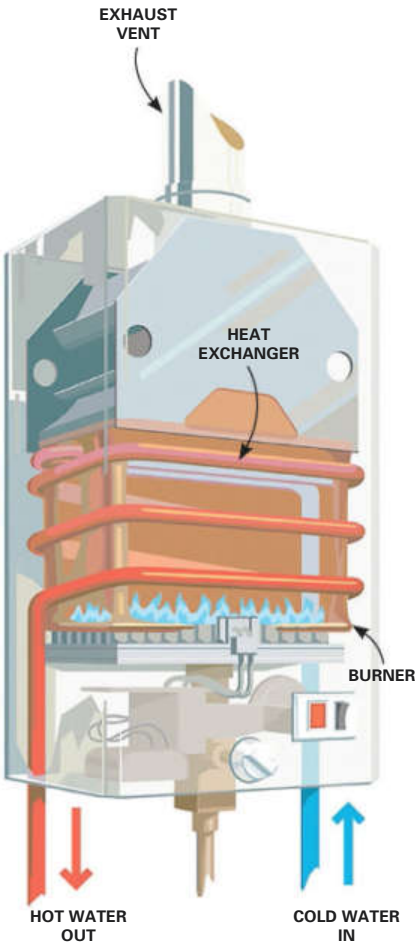
Before you remodel your kitchen

Ordering pizza while your kitchen is out of commission might blow your remodeling budget. Instead, set up a kitchen in your laundry room. You already have a sink there, so all you really need are a few small appliances: a microwave, coffeemaker, and maybe a hot plate and a "dorm room" fridge. Add some shelving and a towel bar, and you'll have a functional place to prepare those budget-friendly mac-and-cheese dinners.

BEWARE OF 'COLOR SHIFTING'

One sunny afternoon, my husband and I selected tile for our bathroom floor and vanity top. The two complement each other beautifully—but only on sunny afternoons. On cloudy days or evenings, the vanity takes on a blue tone and the floor is green. Looks awful. Now we always examine color combinations in different light conditions, natural and artificial, and in fair weather and foul.

Amy Hooper



Will a tankless water heater save money?

A tank-style water heater wastes a lot of energy just by keeping water hot until you need it. A tankless heater, on the other hand, heats water only when you need it. And that makes it 30 to 50 percent more efficient than tank-style heaters.

But tankless heaters are expensive: The costs of installation and of the unit itself often add up to a price tag two or three times that of a tank-style heater. Here's how to weigh the costs and savings: Start with a couple bids from professional installers. Make sure it's a total bid that covers everything involved. Then search online for "tankless water heater savings calculator." Supplied with details (your energy costs, water use, etc.), an online calculator can estimate your savings and payback period.

Continued on p. 111

DIY Quiz

BY MARK PETERSEN editors@thefamilyhandyman.com

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
- There may be more than one correct answer!
- The answers begin on p. 100. Get your DIY rating on p. 102. Good luck!

ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY HSP

1. What's wrong with this photo?
A. The operator is sawing in the wrong direction.
B. Too much blade is exposed.
C. Circular saws are not made for crosscutting.
D. The end of the board should be supported.

2. Which gauge nailer is perfect for installing standard casing around a window?
A. 15 gauge
B. 18 gauge
C. 23 gauge
D. None of the above

3. True or False?
When it comes to shutoff valves, ball valves are more reliable than standard valves.

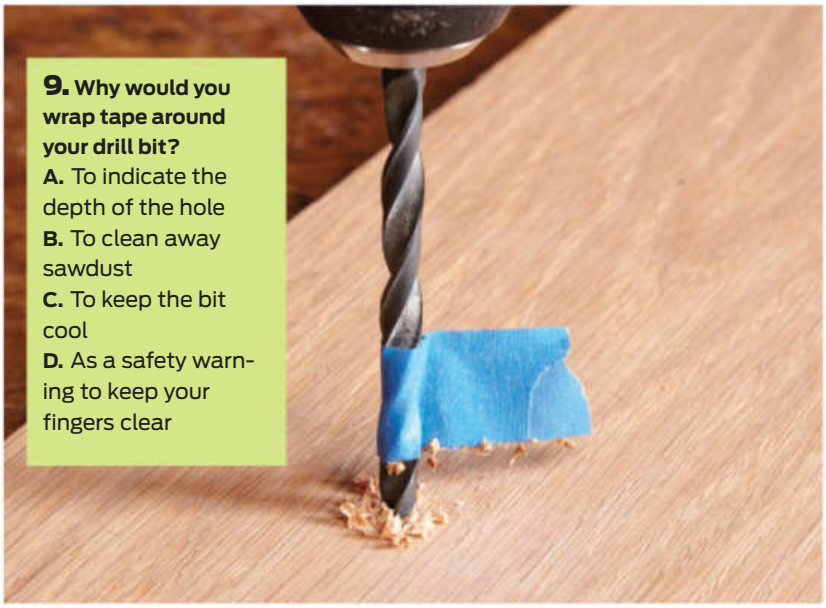
4. What is this tool used for?
A. Making relief joints in concrete
B. Mixing paint
C. Filling mortar joints in brick
D. Filling holes in drywall

5. If your table saw leaves burn marks on the wood, what might be the cause?
A. A dull blade
B. Pushing too hard
C. An out-of-square guide fence
D. All of the above

6. What's the safest way to cut really small pieces on a miter saw?
A. Cut faster than normal.
B. Pull up the blade before it stops spinning.
C. Cut slower than normal.
D. Use a sacrificial fence.

7. What is a painter's comb used for?
A. To clean a paintbrush
B. To texture a wall
C. To clean paint out of your hair
D. To remove wallpaper

8. Where should you use 12-gauge wire instead of 14-gauge?
A. Living rooms
B. Bathrooms
C. Kitchens
D. Bedrooms



9. Why would you wrap tape around your drill bit?
A. To indicate the depth of the hole
B. To clean away sawdust
C. To keep the bit cool
D. As a safety warning to keep your fingers clear

10. True or False? A nail with a blunt tip will cause wood to split more than a nail with a sharp tip.

Find the DIY Quiz answers on pp. 100 and 102.

11. What's the best way to eliminate chipping out the corners when you're routing the end grain of a board?
A. Work clockwise.
B. Work counterclockwise.
C. Rout the sides first.
D. Rout the ends first.

12. Where would you find the rim joist on your house?
A. At the ends of the floor joists
B. Above a deck post
C. Holding up a header
D. Holding up a roof truss

13. Which chalk line color is best for most tasks?
A. Red
B. Blue
C. White
D. Fluorescent

14. Which drill bit creates precise, flat-bottom holes?
A. Forstner
B. Spade
C. Twist
D. Auger

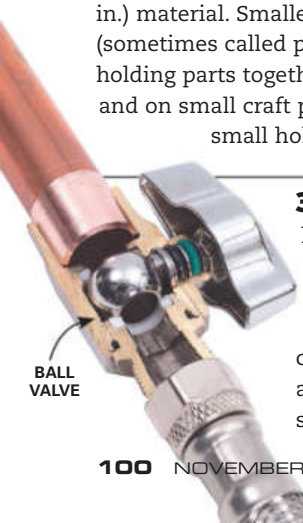
15. If you could have only one size Phillips screwdriver for home repairs, which would be the best choice?
A. No. 1
B. No. 2
C. No. 3
D. No. 4

DIY Quiz Answers

1. (**B**) Too much blade is exposed. Set your blade between 1/4 in. and 1/2 in. below the surface of the wood. A blade that's set too shallow may not cut all the way through the wood if your saw rocks a bit. And setting the blade too deep is dangerous because more of the blade is exposed while cutting, and the saw is more likely to bind and kick back.

2. (**B**) An 18-gauge brad nailer is the tool of choice for most trim. It shoots brads from 5/8 in. up to 2 in. and leaves a small hole that can be easily hidden with a dab of putty. Larger, 15-gauge nailers are better suited for hanging doors and working with thicker (3/4-in.) material. Smaller, 23-gauge nailers (sometimes called pinners) work great for holding parts together until the glue dries and on small craft projects where super-small holes are desirable.

4. (**C**) This thin tuck-pointing tool is used in conjunction with a brick trowel to fill mortar joints when repairing a brick wall.



3. True. Shutoff valves go unused for years. Standard valves have rubber washers that harden with time and other fussy parts that become caked with mineral deposits, causing the valves to fail. Ball valves are simpler inside. A ball with a hole through it opens and closes with a quarter turn—fewer complex parts and fewer things to go wrong. Ball valves almost never let you down, and this reliability costs you only slightly more per valve.

5. (**D**) All of the above. A dull blade is the most common cause of burning wood, but pushing too hard and a guide fence that's out of whack could also be the problem.

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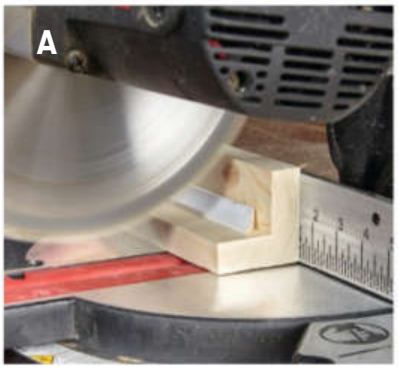

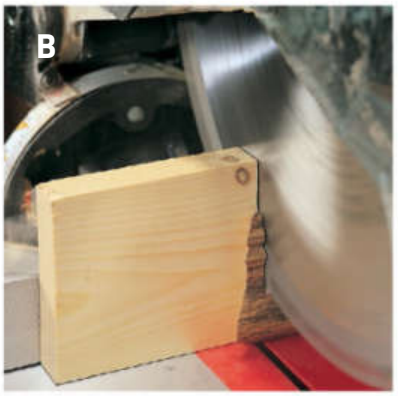

6. (**D**) To avoid launching small pieces across the room, use a sacrificial fence. Build a two-piece fence for tiny material like this cove molding (**Photo A**). Or just use a scrap board to back up small cutoffs (**Photo B**). Mark the location of the screws that hold a two-piece fence together, so you don't accidentally cut into one, or assemble your fence with glue. And always hold the saw down at the end of the cut until the blade comes to a complete stop.

7. (**A**) Rinsing out a paintbrush with water will get it clean, but combing a brush under running water with a $5 painter's comb will get it cleaner. And after washing, the comb helps straighten the bristles so they don't fan out as the brush dries.

8. (**B & C**) Bathrooms and kitchens need a dedicated 20-amp circuit, which requires 12-gauge wire. Twelve-gauge wire is often wrapped in yellow plastic sheathing instead of white.

9. (**A**) Sometimes, drilling too deep is a bad thing. You can make your own stop collar by wrapping tape around a bit at the same depth you want your holes.

10. False. If you're having trouble nailing into brittle wood without splitting it, set the head of your nail on a hard surface and give the tip a tap with your hammer to flatten it a bit. A blunt nail will push through the wood rather than wedging it apart like a pointy nail does.

11. (**D**) If you're planning to rout the ends as well as one or both sides of a board, rout the two ends first. Here's why: End grain has a tendency to split as the bit exits the end of the cut. If you rout the ends first, the damaged area will be removed when you rout the sides. Another way to avoid chip-out is to clamp a scrap on the end of the cut.

12. (**A**) A rim joist is the piece of lumber that locks the floor joists together and helps bear the weight of the walls above it.

13. (**B**) Fill your chalk box with blue chalk for general use. Red stays visible longer, making it a good choice for lines that must survive a few days of weather. White is easy to remove and is best for interior painting and wallpapering, where colored chalk could bleed through. Fluorescent is easier to see on some surfaces but may be too permanent for general use. Check the permanence scale on the container if you aren't sure.

14. (**A**) Forstner bits are perfectly suited for finer woodworking projects that require larger holes. Spade and auger bits work best for drilling rough holes fast.

15. (**B**) To avoid stripping a screw, it's important to use the right size screwdriver. A No. 2 screwdriver will fit most Phillips-head screws sold at home centers and hardware stores. There are eight sizes of Phillips screwdrivers, but Nos. 1 – 3 are the ones you'll need for most home repairs.

WHAT'S YOUR LEVEL OF EXPERTISE?

Beginner: 0 – 5 correct
Intermediate: 6 – 12 correct
DIY Guru: 13 – 15 correct

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HOW TO TEST FOR LEAD PAINT

If your home was built before 1978, it may contain lead paint. Most lead-paint poisoning occurs by exposure to lead dust. Testing the dust will determine if you have a lead hazard. The test kits are available at home centers and hardware stores and include step-by-step instructions for collecting the samples, bags for the samples, plastic gloves and an envelope to send the samples to an EPA-certified lab for analysis. Results, mailed back in about two weeks, will tell if the samples contained a potentially harmful level of lead. If you have a lead hazard, contact your local health department or the Environmental Protection Agency (epa.gov/lead) for remediation guidelines.

TAKE A SAMPLE AND SEND IT IN
Wipe the test area in a backward "S" pattern with a moist cloth, picking up dust to use as a sample.

Safe ladder setup

Ladder safety starts with careful setup. Sloppy setup leads to falls, even if you climb cautiously.

Setting a ladder at the correct angle is the key to stability. Too steep and it can slide sideways or tip backward. If not steep enough, the feet may slip. To get it right, put your toes against the ladder's feet. Stand straight up and extend your arms. Your palms should just reach the ladder's rung.

GOT A HOMEOWNER TIP?

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Stop leaks under doors

If you can feel the breeze or see daylight under your entry door, that's bad news. The good news is that you can adjust most thresholds up or down just by turning a few screws. Turn all of the screws equally until the door opens and closes without much drag and without letting in a draft.

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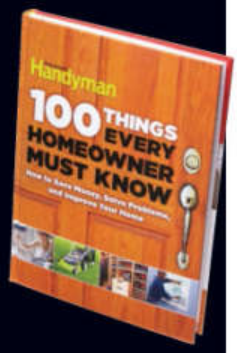

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OVER-INSULATED BEDROOM

When I rented the machine to blow insulation into my attic, I was told that the on/off switch at the end of the hose didn't work. But there was another switch on the machine, so I didn't worry about it. I manned the hose in the attic while my dad fed insulation into the machine, and everything went fine until I dropped the hose. It instantly slipped down through the scuttle hole and blasted the bedroom with insulation until my dad heard me yelling to shut off the machine. Now I know why they warned me about the faulty switch.

Jeremy Warner

Stranded and phoneless

One evening after my wife and daughters left the house for a few hours, I enlisted my four-year-old son to help me inspect our brand new roof. I got the ladder out and climbed up on the roof as my son watched from the ground. Not a minute after I was up there, our hyper puppy wrapped its leash around the bottom of the ladder and yanked it down, narrowly missing my son. He was fine, but I was stranded.

I hollered down to my son to get my phone so I could call a neighbor. "Throw the phone to Daddy as hard as you can!" As the phone flew through the air in what looked like slow motion, I realized his arm wasn't quite strong enough to get the phone to the roof—and it shattered on the concrete below. I had to be patient and wait on the roof until someone who could help walked by. Needless to say, I'll keep my phone in my pocket the next time I venture onto the roof.

David Duncan

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DIY TIP GENIUS

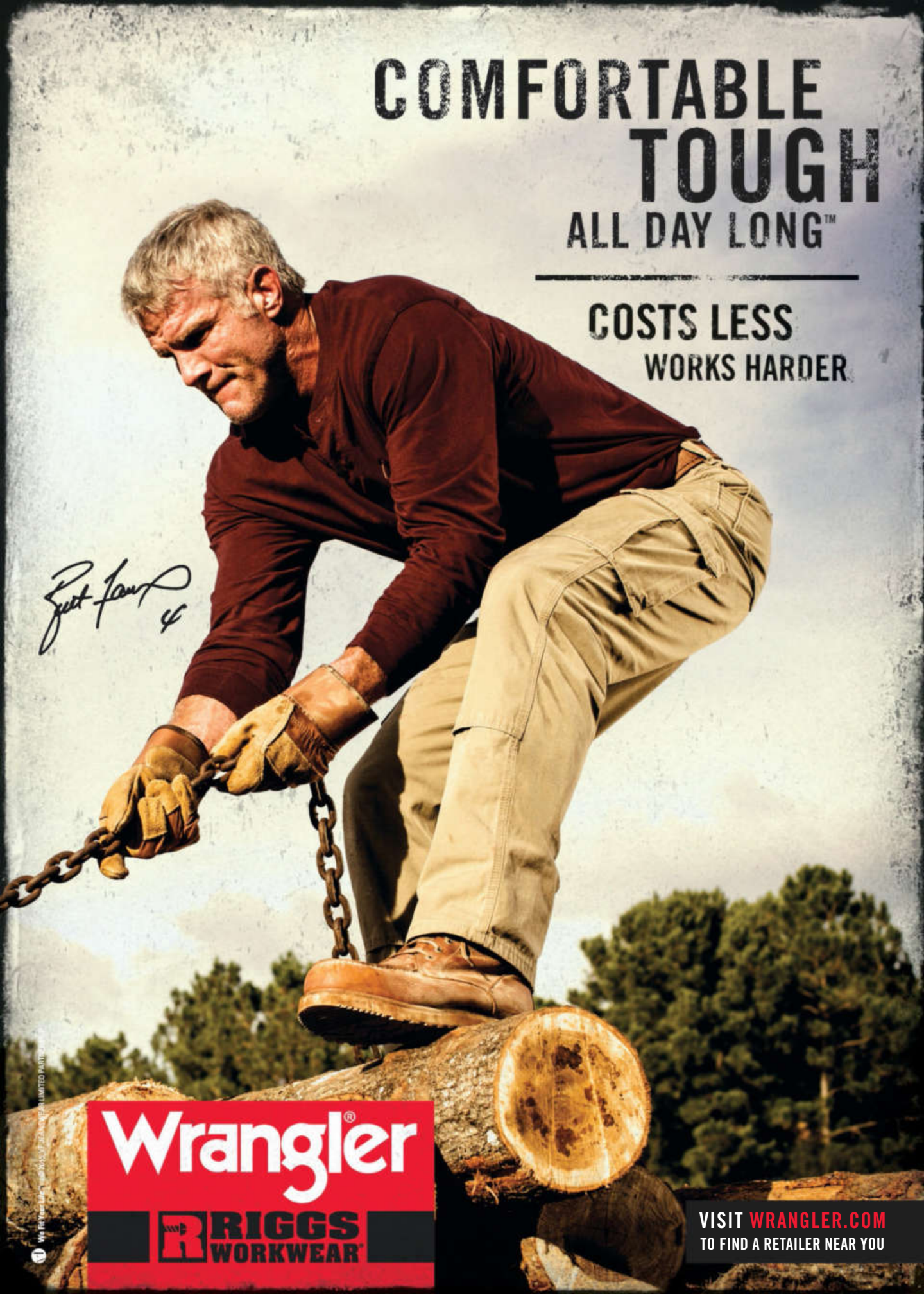
A little stray paint

I recently helped a friend spray-paint a bathroom radiator. Before getting started, I set a fan in the window for ventilation. The fan evacuated the overspray nicely, and the fresh coat of white paint looked great. But when we removed the fan, we were surprised to see a white doughnut shape on the window screen! Seems the overspray had found a place to land. A little black spray paint fixed our goof!

James Metz

EDITOR **DAVID RADTKE** • ART DIRECTION **MARY SCHWENDER** • ILLUSTRATIONS **STEVE BJÖRKMAN**

Got your own DIY mistake? **GET A $100 GIFT CARD FOR YOUR GREAT GOOF!** See p. 4.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